

# COMPUTERWORLD

## Webmasters

Young cyberwizards strive to conquer on-line world

By Kim S. Nash and Thomas Hoffman

**B**race yourselves, IS managers. The World Wide Web has bred a crop of technical whippersnappers who think art is as important as command-line programming. And they want to be masters of the on-line universe.

Who are these webmasters? When they're not marketing folks, they're you — only more creative, less by-the-book, often several years younger and quite comfortable with the theory that data doesn't have to reside under lock and key.

Webmaster, in fact, can be a little mystical for information systems folks used to down-and-dirty programming or systems administration, according to the 50 users and analysts recently interviewed by Computerworld.

Robert Holt, for example, is the webmaster.

Webmasters, page 32



Hire twenty-somethings for Web work, says UPS' *Joak Cohen*

## Win 95: Better read the manual!

By Laura DiDio

The adage "forewarned is forearmed" is haunting scores of users who didn't properly prepare for the integration of Microsoft Corp.'s Windows 95 clients with Novell, Inc.'s NetWare file servers.

Users who didn't do their homework by implementing test networks and referencing the Windows 95 Resource Kit are now suffering the consequences.

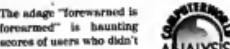
Even a month before Windows 95's late August ship date, 65% of 100 information systems professionals surveyed by Computerworld had no implementation plans ready.

The price for such lack of preparation ranges from minor printing problems to major net-

work and system crashes, lookups and security breaches. In the past month alone, nearly 10,000 users posted technical queries on Microsoft's Windows 95 and Novell's NetWire forums on CompuServe and Internet newsgroups.

The irony of the situation is that Windows 95 itself has been relatively bug-free in its first two months of release. In fact, Microsoft has "no plans and no need to do a maintenance release to correct problems," said Rob Bennett, product manager at the Personal Systems group (see story, page 2).

Most of the problems aren't caused by any inherent flaws in Windows 95, said Jeff Thiel, group manager for Windows 95, and Clark Heindl, a Windows 95, page 43



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## 3Com hub users say they'd rather fight than switch

By Bob Wallace

With its acquisition of Chipcom Corp. now complete, 3Com Corp. last week detailed business and product plans that raised concerns among users of both vendors' networking products.

Though the deal makes 3Com the second-largest internetworking vendor behind Cisco Systems, Inc., some users have



Manager Steve Lopez: "We don't want 3Com to get distracted by the merger and have resources siphoned off to Chipcom."

reservations about its product positioning and network management plans. Even basic business issues such as distribution strategies are worrying some users, according to several customers interviewed last week.

3Com's decision to position Chipcom's high-end Oncore Switching System as its flagship all-purpose 3Com, page 16

## Tuxedo dresses down

Novell targets client/server users with tool

By Craig Stedman

Novell Inc. next week will add new administration, security and event-driven processing features to its Tuxedo transaction monitor to make the software easier to handle distributed applications, sources said.

Users and analysts familiar with Novell's plans said Tuxedo 6 should have broader appeal as middleware for client/serv-

er environments. Tuxedo is becoming increasingly central to Novell's distributed computing strategy, but many shops have resisted transaction monitors because of the complexity inherent from the complexity of the mainframe past.

Novell is "really struggling with its positioning" as it tries to make Tuxedo more palatable to customers, said Mitchell Kramer, an analyst at Patricia Seybold Group in Tuxedo, page 143



The new bid on the networking block has gained some fans. Lab tests and user interviews position Windows NT as a viable alternative to longtime network operating systems like NetWare. NT beat NetWare in some lab tests and posted second big wins in a Computerworld customer satisfaction survey of network operating systems.

CW Guide,  
page 106

### OVERALL SATISFACTION

Microsoft Windows NT	70%
SUN Solaris	73%
Beosys Vines	71%
Novell NetWare	68%

Source: Computerworld's annual survey of network operating systems. Survey period: July 1995.

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October 23, 1995

## News

### NEWS

#### **2 Windows NT clustering**

AT&T Global Information Solutions will deliver new clustering technology for Microsoft's Windows NT by year's end.

#### **4 Apple users frustrated**

As Apple begins to focus on consumers this holiday season, corporate users are frustrated by Apple's more than \$1 billion order backlog.

#### **5 ITT revamps IS**

ITT consolidates information systems functions globally for hotels and entertainment and considers a centralized information technology structure.

#### **10 Imaging/workflow**

At a trade show this week, imaging and workflow vendors revamp product strategies and explain how they are integrating acquired products.

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With its clustering and support announcements, Compaq makes some important strides toward reaching the glass house, but it still must cover lots of territory.

### CORPORATE INDUSTRY

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Computer industry bellwethers report strong gains in the third quarter, though the biggest bellwether of all — IBM — took a larger than expected hit for purchases of Lotus this summer.

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Michael Schrage says: Microsoft is running into the same software development problems identified 20 years ago in *The Mythical Man-Month*.

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Sequent will be the first to use Intel's four-way Pentium units to build a combined architecture, symmetrical multiprocessor server, Charles Babcock explains.



*Turning dreams of access into reality comes naturally in Hollywood. Just ask CIO George Brenner as he offers a studio tour of MCA's executive information system.*

Management, page 94

## Choice Cuts

**Spalding Sports uses imaging to reduce its product development cycles. Workgroup Computing, page 57**



## LOVE IT C/C++ HATE IT

*Information systems professional David Baer has a love/hate relationship with C/C++: He loves its power but hates its complexity.*

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The Macintosh is making some inroads into high-finance and investment banking.



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Hewlett-Packard will launch a program to buy back PCs and workstations — regardless of the vendor name on them — beginning in January.

### WORKGROUP COMPUTING

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Sun boasters' wait time on its high-end Unix servers, adding faster chips and allowing on-board processors to grab more memory as they need it.

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Legato unveils a Microsoft Windows NT version of its NetWorker backup software.

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On one hand, the ATMES project — the largest international Token Ring Modem trial currently underway — completed its second successful demonstration Oct. 13 and plans a live transmission from a ship in February. On the other hand, one of the technology's raisons d'être, carrying voice traffic over data lines, looks like it is going to take a

while to catch on in corporations.

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It's here, and it's getting better. But it has some growing up to do.

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IBM's bundling of MV/Swift several supporting products promises to alter the whole software fabric of data center life. Mainframe shops should benefit from lower software prices and shorter installation and testing cycles, but they must first put their faith in IBM's integration skills.

#### **84 Metadata vendors unite**

Six vendors involved in data warehousing say they will standardize their metadata, making it simpler for end users to mix and match tools.

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A new development tool from Oberon Software gives developers a graphical environment for linking applications using OLE. Microsoft's software component architecture.

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# AT&T GIS joins NT cluster bandwagon

Add-ons to expand backup and availability

By Joan S. Bowman  
BOSTON

**AT&T Global Information Solutions** will deliver new clustering technology in the form of add-on software modules for its Microsoft Corp. Windows NT servers by year's end, senior AT&T GIS executives said last week. A formal announcement may come as soon as next month.

The company's LifeKeeper modules, which now run only on its Unix servers, will add the ability to cluster two or more NT servers for backup and high availability purposes.

NT clustering is important to users because it would mean more uptime for NT servers used as LAN servers.

The news comes just one week after Microsoft announced it is forging a set of Microsoft-centric clustering application programming interfaces (APIs) for NT with six systems vendors, including

AT&T GIS and Digital Equipment Corp. (CW Oct. 16).

The Microsoft APIs will allow software vendors to write "cluster-aware" applications that can be broken up to run on multiple servers. The Redmond, Wash., company gave no dates for the availability of the APIs, however.

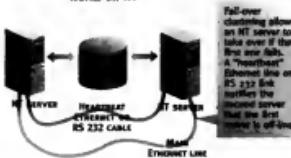
Over time, Microsoft also plans to build clustering into its NT kernel (CW, Oct. 16).

#### Add-on anticipated

The AT&T GIS clustering technology will be delivered as add-on software modules with the company's hardware servers, said James E. Clarke, vice president of AT&T GIS' software and communications solutions group.

AT&T GIS plans to ship its fail-over clustering module, which allows one NT

How AT&T GIS' LifeKeeper works on NT



server to take over for a server that has failed, later this year. A shared-memory clustering module with a distributed lock manager to prevent users from erasing shared disk-drive files is set to ship next year. The fail-over module goes to beta testing later this month.

"If we could do a backup type of environment with shared disk, it would be of interest, absolutely, because all of our LAN servers have their own disk today."

said David Barrett, vice president of information technology architecture at Invesco Funds Group, Inc., a mutual funds investment firm in Denver.

The company has six Windows NT servers from AT&T GIS and Compaq Computer Corp., which support LANs with 350 end users. It also has AT&T GIS high-end Unix servers, including the NCR 5600, for large database applications.

## IBM links DB/2, Lotus Approach

Integration to ease support, development issues for IS

By Cheryl Gerber

IBM last week staged a sneak preview of the links it has forged between its mainframe DB/2 database and Lotus Development Corp.'s Approach desktop database for Windows 95, which is slated to ship by the end of the year.

IBM Lotus showed the integration at the DB/2 technical conference in Nashville. Through the links, users can join DB/2 to other data types, such as those of Oracle Corp. databases and Notes groupware, said an attendee who requested anonymity.

Approach 95 will be available when IBM/Lotus begins shipping the 32-bit SmartSuite 95 by the end of the year. Although the company hasn't yet priced SmartSuite 95, its biggest competitor — Microsoft Corp.'s Office for Windows 95 Professional version — costs \$600. The current stand-alone version of Approach is priced at \$125; the current suite version, Lotus SmartSuite 4.0 for Windows, costs \$399.

The link between DB/2 and Approach could help information systems departments with support and development. "Users who have trouble doing complex [database] joins end up going to the IS department for help," said Michael Edel, an attendee and database administrator at ARDIS Co., the Motorola, Inc. wireless division in Lincolnshire, Ill. "But you could probably even give this to the accountants, and they could do complex joins without having to ask for help."

Edel said the ARDIS financial systems are Oracle-based, while the company's operational and network data is in DB/2. "There's no way, other than unloading the data and importing it,

that we can get that connectivity [between the two]," he noted. "But we can do that with the Approach DB/2 links I've seen here."

IBM Lotus showed off a trio of new features in the 32-bit version of Approach, called Approach 95: SQL Assistant, enhancements to data analysis and TeamMail.

SQL Assistants are tabbed interfaces that walk users through the process of extracting specified information from DB/2 or other databases. Enhancements to data analysis include the ability to drag and drop DB/2 fields from within Approach to create cross-tab reports. TeamMail provides the ability to send or route a report done off DB/2 data via electronic mail, the attendee said.

#### GIS market benefits

One Approach user is now building remote sensing applications for geographic information systems (GIS). The GIS market could benefit from the integration of DB/2 and Approach by providing easier access to the large database system, said Stacy Myers, a consultant and professor at Nown Southeastern University in Dallas, Fla.

IBM hopes the integration between the two databases will boost stand-alone sales of Approach as well as improve its strategic position in the market.

"You now have from IBM from the desktop to the mainframe. No other vendor has that yet," said Nicole Miller, an analyst at International Data Corp.'s Mountain View, Calif., division.

The DB/2 links are also needed for SmartSuite, given that the 32-bit version of the suite's popular 1-3-3 spreadsheet will not be ready when the next version of the suite ships.

## Microsoft claims sales of 7 million for Windows 95

By Stuart J. Johnson

Less than two months after shipping Windows 95, Microsoft Corp. claims to have sold 7 million units. The company also said it

won't ship a maintenance release of the system, which may cause some corporations to delay purchase a while longer.

Microsoft has "got to get over that mind-set. Mainframe IS shops never buy until [a new system] comes out with a .1 [maintenance] release," said Rob Enderle, an analyst at Datalogix, Inc. in San Jose, Calif. "I don't think Microsoft will see the volumes they want [in the corporate market] until they do."

However, Microsoft claims the initial release is so clean it doesn't warrant a maintenance release. Moreover, possibly venturing into semantics, Microsoft draws a distinction between a maintenance release and its planned "service pack," which it formerly referred to as "tune-up packs," said Rob Bennett, product manager at Microsoft's Personal Systems group.

The service packs will include new capabilities and utilities such as the Novell, Inc. NetWare Directory Services client that Microsoft made available on-line last week. Other forthcoming tools will include integrated Services Digital Network and infrared device sup-

port for Windows 95. If any minor bug fixes are made, they would also be included in the service packs, Bennett said.

The first of the service packs will probably come out early next year, Bennett said. Initially, they will be available only on-line.

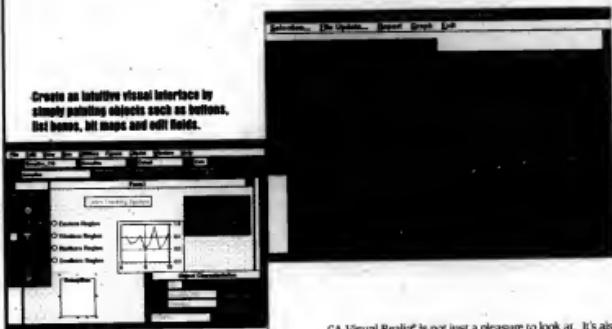
Meanwhile, sales of Windows 95 to date match Datquest's aggressive projections of 20 million units for calendar 1995, Enderle said. If sales continue at the same or higher levels, Microsoft will hit or come close to Datquest's estimate, he said.

The 7 million units that Microsoft has sold so far include shrink-wrapped packages and 4 million new PCs bundled with Windows 95, said Brad Chase, general manager at the Personal Systems group.

Meanwhile, executives at Microsoft's Product Support Services organization claim the crush of calls to the company's technical support lines has subsided to a manageable level. "Since about the first three weeks we haven't had any busy signals, and the wait before a user gets to talk to a support engineer is now less than 80 seconds," said Deborah Willingham, vice president of support.

 The Microsoft Network has some growing up to do. See page 67.

# COBOL Fans: Here's A Sight For Your Sore Eyes.



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# Apple is dreaming of green Christmas

Company must first address severe backlog

By Lisa Piearce

**Apple Computer, Inc.** can't afford to be the Grinch who stole Christmas.

As the lucrative holiday buying season moves into full swing, shoring up Apple's bottom line and fixing its recently tarnished image (CW, Oct. 9) will depend heavily on selling a lot of its Performa brand of consumer Macintoshes — even if other Macintosh models remain hard to get, according to industry watchers.

While product shortages are nothing new to Apple, the situation has worsened recently, and Apple's backlog of orders has ballooned to outrageous proportions — more than \$1 billion. Michael Splidler, Apple's president and chief executive officer, last week told financial and market analysts that he expects the backlog problem to be resolved by early next year.

## Chip dip

Apple attributed its supply problems to a shortage of key components, including quad-speed CD-ROM drives, dynamic RAM, application-specific integrated circuit chips and PowerPC 601 and 604 chips. Observers claim Apple is working

on fixing its forecasting problems to ensure it gets the components it needs.

"There are availability issues across the board, and we are working to get product out there," said a spokeswoman for the Cupertino, Calif., company.

Consequently, users trying to purchase some of Apple's popular Power Macintosh models are frustrated. Apple's 604-based Power Macintosh 8500 models, which include support for digital audio and video, are on back order for at least a month. Supplies of the Power Macintosh 7300 series and the PowerBook 5300s are also tight. It takes about three weeks to get these models, according to dealers, retailers and potential buyers.

"Take my money, please," said a graphics designer at a San Francisco publishing house, who asked not to be named. "I have the cash and want an 8500, but I can't find anyone to sell me a system."

However, industry watchers say it is imperative that Apple concentrate on having enough consumer systems available, even if it is at the expense of corporate users.

"The 8500 buyer will wait for a couple

of weeks if they have to. So that is definitely revenue" for Apple, said Peter Hartcock, editor of "The Hartcock Letter," an industry newsletter in Alameda, Calif. "But the guy who goes into a store to buy a Performa for his kid for Christmas won't wait. If there are no Performas, he won't buy. What else do you have?" That revenue is lost.

And right now, Apple can't afford that. Last week, the company reported that earnings for its fiscal fourth quarter, which ended Sept. 29, tumbled by 47.9% compared with the same quarter last year.

Symptoms	Diagnosis	Apple's home remedy
Copland and OpenStep see late	Overestimated delivery date and bug problems.	Better late than never.
Slow booting of Power Mac 8500, 7300 and 5300	Shortage of key components such as quad-speed CD-ROMs, DRAM, SCSI cards and logic chips.	Move to standards such as PCI to increase supplies.
Miscellaneous mishaps	PowerBook 5300 overheats and burns into flames.	Replace batteries with nickel-metal hydride batteries.
Financial woes	Os profits fell 34% from Oct. 1993.	Continue to reduce gross margins and increase units shipped.
Demanding market	Share falls to 7.3% in 1995 from 8.5% in 1993.	Cut Macintosh pricing, increase number of Mac OS licenses.
Declining computer sales in general	N/A	N/A

of weeks if they have to. So that is definitely revenue" for Apple, said Peter Hartcock, editor of "The Hartcock Letter," an industry newsletter in Alameda, Calif. "But the guy who goes into a store to buy a Performa for his kid for Christmas won't wait. If there are no Performas, he won't buy. What else do you have?" That revenue is lost.

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## Rise in shipments

Sub demand for Apple products has increased. The company raised its fourth-quarter Macintosh shipment by 25%, to approximately 1.5 million units, over the

same period a year ago. Apple is attempting to further boost sales and snagging market share by competing head-to-head with IBM and Compaq Computer Corp. on price.

"Their belief is that the best opportunity to grow market share is eliminating the perception that Macs are more expensive," said Kurt King, an analyst at Montgomery Securities in San Francisco. "Expect very significant pricing actions in the near future."

But if Apple can't deliver the products, price may be moot.

"People still want Apple products, but there will come a point where people won't want forever," said Joseph Ferlazzo, an analyst at Workgroup Technologies, Inc., a market research firm in Hampton, N.H.

# NetWare 4.1 component flawed

Bug found in some copies of Novell software licensing kit

By Laura DiDio

Novell, Inc. executives last week acknowledged a flaw in several thousand copies of the licensing part of the company's fault-tolerance software for NetWare 4.1. The error, which the executives said has been fixed, allowed only a single user on each server to get

## The fault-tolerance features.

The software, called the System Fault Tolerant II Licensing Kit (SFT II), provides users with mirrored servers to replicate data. It is said to give businesses full server redundancy and 100% uptime.

## Bad batch

Michael Bryant, Novell's product marketing manager for SFT II, said a manufacturing error occurred in a batch of about 5,000 copies of the licensing piece for SFT II. The licensing code is supposed to give full disk-mirroring capability to all users attached to a corporation's servers.

Bryant emphasized that there are no problems with the underlying SFT II code, which is integrated into every copy of NetWare 4.1, and said that only about 24 customers have been affected by the problem.

The flaw has been fixed, and all of the affected users have "clean copies of the diskette," he added.

With the exception of the 24 flawed diskettes that would wait at customer sites, an overwhelming majority of the 5,000 affected SFT II licensing diskettes remained unsold "in distributors' warehouses or the West Coast," Bryant said.

Novell did not provide the names of any of the users who experienced the problem.

But Michael Goude, a senior consultant at Patricia Seybold Group in Boston, said that "if only 24 customers were affected out of 5,000, it indicates that very few users are utilizing the SFT II functionality in NetWare 4.1 to support mission-critical applications."

A Novell spokesperson said the company "conservatively estimates that 10% to 20% of the installed base of 6 million NetWare 4.1 coders are utilizing SFT II."

# Pentium price reductions prompt shift in PC market

By Jaikumar Vijayan

Relentless price cutting on Intel Corp. Pentium chips has shifted some high-end 120- and 133-MHz Pentium-based configurations into the sub-\$2,500 mass-volume range.

"Intel's idea is to move the volume space to the 120-MHz by year's end," and system vendors are responding by passing the price cuts to customers, said Joseph Ferlazzo, an analyst at Workgroup Technologies, Inc., in Hampton, N.H.

For example, business PC announcements from Dell Computer Corp. and Hewlett-Packard Co. are based on these two chips.

## New releases

Dell last week launched 24 PCs based on a wide variety of Pentium processors, including the 120- and 133-MHz chips.

The systems include the Dell OptiFlex GX line, which is the company's first line of desktops to of

fully integrated multimedia capabilities in a corporate PC.

Prices start at \$2,310 for a 120-MHz system with 8M bytes of RAM, a 5.04-MB hard disk, 24 bytes of video RAM and a monitor.

HP, meanwhile, will introduce this week its VLSI Series 4 PCs based on the same chips.

The minitower systems will sit on top of the company's Vectra PCs for business users and will feature high-end graphics capabilities, according to the company.

A 130-MHz system with 8M bytes of RAM and a 10-GHz hard disk costs \$2,105.

The falling prices are in line with market expectations of a sub-\$2,000, 120-MHz Pentium system by year's end, Ferlazzo said.

Wide availability of the 120-MHz chip will push systems based on the 90-MHz Pentium to the low end of the corporate desktop market.

HP will launch a program to buy back PCs and workstations beginning in January. See page 50.

## Support is available

Users who find a bug in their SFT II Licensing Kits for NetWare 4.1 or their 2-User NetWare 4.1 Software Development Kit can get replacement software within 24 hours by calling Novell's technical support hot line at (800) MET-NETWARE. Customers who need the kits immediately can ask Novell's technical support personnel to upload clean copies of the software to a secure bulletin board.

## R a t a b a s e P e r f o r m a n c e

The TPC-CTM benchmark is the industry standard test for measuring database On-Line Transaction Processing (OLTP) performance. On July 24, Hewlett-Packard published the record-setting 5369 tpmC Oracle7 benchmark.

**ORACLE7**  
**BEST: 5369 tpmC**

ORACLE E7 HP 9000 T500



**Informix**  
EST: 3534 rpmC

REFST-3534 from C



**Sybase**  
**BEST: 1708 tpmC**

REF ID: 1708 tomC



Informix	Sun SPARCcenter 2000E	
Informix	AT&T 3555	
Informix	HP 9000 T500	
Informix	Bull ESCALA Rack R291/8	2660
Informix	HP 9000 K400	2616
Sybase	Digital Alpha 2100 4/275	1708
Informix	Bull ESCALA Rack R291/4	1562
Sybase	Compaq ProLiant 4500 S/100	1516
Informix	NEC UP 4800/650	1489
Informix	DG AV 9500+	1416
Sybase	HP 9000/600/H70	1403
Sybase	IBM RS 9000 PowerPC J30	1298
Informix	NEC UP4800/675	1245
Sybase	Sun SPARCserver 20	1064
Informix	Fujitsu/NCL Superserver K474	1002
Sybase	IBM RS 6000 390	902
Informix	NEC UP4800/650	900
Informix	SNI RM 400 Model 63	874
Informix	NEC UP4800/640	868

These are the top 20 Oracle, Informix and Sybase TPC-C benchmarks as of September 1, 1995.

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# ITT eyes IS merger for \$1 billion boost

By Mitch Wagner

Linda Boardman heads up sales and marketing at the Sheraton Music City Hotel in the country music mecca of Nashville. Giving her an aching-breaky heart wouldn't be that hard.

"I would quit if they took my computer away from me," Boardman said, referring to her PC, which connects to the hotel's mainframe-based booking system.

**From the Dark Ages**  
Until two years ago, the hotel still did its bookings by hand. But the addition of the automated system vastly increased productivity and customer satisfaction. Boardman said.

Now ITT Corp., the parent company of Sheraton and many other properties, has plans that will really give Boardman and her colleagues something to talk about.

ITT plans to add about \$1 billion to its \$7 billion annual hospitality and entertainment revenue by consolidating infor-

mation systems from about 50 business units into a single system, said Dave Starr, vice president and chief information officer at ITT. The new system will

asking ourselves," Starr said. "We need to use technology to get the different business units working together and to come up with new revenue sources."

ITT will spend \$60 million to \$70 million during the next two years to standardize on Oracle and PeopleSoft, Inc. applications running on Oracle databases. The company plans to make the money back in a single year of savings on duplicated resources, Starr explained.

ITT also will use the Oracle backbone to generate revenue through shared marketing and exchanging reservations data and customer preferences among Sheraton and Caesar's properties. "They'll know all about you from

your previous visits to any ITT property," Starr said. "They'll know what kind of wine you like and whether you want a smoking or no-smoking room."

The computer systems reorganization that Starr is managing is part of a larger plan to split ITT into three companies by year's end, including ITT Industries in



Caesar's Palace is among the ITT properties that will benefit from a system unified on Oracle and PeopleSoft applications.

ne Oracle Corp. technology, he said.

Besides the 430-hotel Sheraton chain, ITT owns Madison Square Garden in New York and Caesar's World resort in Las Vegas, Atlantic City, Lake Tahoe and other gambling centers.

"Where is the next billion dollars going to come from" is the question we're

Harrison, N.Y., and ITT Hartford in Hartford, Conn. The information technology departments at ITT Industries and ITT Hartford will change very little, Starr said, because they already operate as independent business units.

There are 3,500 members of the information technology staff at ITT, and it will be left with about 500 people after the split. The total IT budget for this year was about \$750 million, with about a quarter of that heading for the new ITT.

## Industry trend

Jerry Loe, president of Computer Sciences Corp.'s information technology management consulting unit in New York, said the consolidation of systems between hotels and casinos is sensible.

"In the case of travel and lodging, a lot of the things one needs in hotels and restaurants have a fair amount of commonality," he said.

ITT is one of many companies in the travel industry looking to redesign and centralize IS functionality.

Boardman said she favors centralization. "Right now, what I find a lot of the time is that there's not clear communication," she said. Often, the information technology staff doesn't know what kind of software is installed at individual hotels, she explained, so weeks can be lost tracking down solutions.

# Users hit RS/6000 chip blockade

By Jean S. Bezman

Users about to hijack the power ceiling on their IBM RS/6000 Unix servers will find a major upgrade path blocked until next year.

IBM announced its first symmetrical multiprocessor (SMP) Unix servers a year ago. They were based on the PowerPC 601 chip, and users who bought them were promised a free upgrade to the next version of the chip by the middle of this year. But IBM is running a year late with the promised PowerPC 604 upgrade, and customers will have to wait until the middle of next year.

Users were looking forward to 50% to 60% more power with the SMP upgrade.

Users who expected that new servers based on yet another advanced chip—the 64-bit PowerPC 620—would ship this year also will have to wait until next year while IBM re-evaluates its plans for that chip.

IBM quickly must clarify the upgrade issue with RS/6000 users, who

lysts said.

"I think it's fair to say that any delay in the 604 or 620 systems is cause for concern for their customers," said Tom Copeland, a Unix systems analyst at International Data Corp. in Framingham, Mass. "[Users] need to see a clear path of growth with the PowerPC."

If there is any problem with future generations, that could cause [users] to look to other Unix vendors."

Roy Dodd, information systems director at The Good Guys, an electronics store chain in Brisbane, Calif., is one user who expected to receive the promised free upgrade this year for its RS/6000 Model 430.

"I'm still going to get this freebie. It's just going to be later," Dodd said. His site has three large RS/6000 servers that run mission-critical inventory applications. Of his original two-processor 430 server, he said, "I've actually had to go buy some

more 603 processors to go in there."

IBM officials insisted there wasn't an upgrade crisis—at least not yet

They said last week that users who are running out of processing capacity can buy more PowerPC 604 processors or cluster several SMP servers together, until the new batch of high-end PowerPC chips arrives next year.

IBM also said its tests of the next generation of PowerPC 604 chips show that they are just as fast as the 603s.

The faster 604E chips, which have up to 35% more power, also are due next year.

## SMP sticking points

At the same time, IBM is having more trouble than expected getting many PowerPC 604 processors together for the SMP Unix servers.

"It's just a matter of getting the SMP support chips put together," said Jeff Mason, vice president of RS/6000 worldwide marketing. "It has nothing to do with the availability of the 604."

Uniprocessor 604 servers are shipping in volume now.

IBM's effort to sell alternative machines to users won't readily address the RS/6000 server upgrade problem, said Bill Moran, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. "It's really not good to get somebody to make business plans based on what you tell them and then go back and take the rug out from underneath them," he said.

## Work around it

Some increase funding workarounds while others for IBM to update its RS/6000 Unix servers with PowerPC 604 chips.

"We just went ahead and purchased 670-meg servers," said Carrollton, computer department manager at Whittemore, Chilcott & Morell, an architectural firm in Chicago. The company has more than 60 RS/6000 workstations. Another strategy is to add more RS/6000 workstations to the corporate network to share processing power, she said.

IBM has suggested that users buy an RS/6000 parallel processor, which starts at \$20,000, or a clustered RS/6000 system with up-to-eight RS/6000 "nodes" that provide up to 64 processors in all.

But users don't buying 604s or clusters just to broaden their data and application base can be moved to parallel or clustered machines.

"You could just buy another platform, put that's an aggressive estimate," said Roy Dodd, information systems director of The Good Guys. He suggested that users could break up database into smaller pieces to run on several uniprocessor servers. His site's three RS/6000 servers already share portions of an Informix database, less 7.1 inventory data, he said. —Jean S. Bezman



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# Bay puts together stackable switch

By Bob Wallace and Laura DiDio

**B**ay Networks, Inc. is expected this week to announce a stackable 100Base-T and a stackable workgroup switch in a two-pronged assault on the high-speed networking market. *Computerworld* has learned.

Bay's new 100Base-T Stackable Hub can be configured to support 12 or 24 100M bps ports and can be stacked to support a total of 122 ports, said sources close to Bay who requested anonymity.

"The new hub is positioned to complement rather than replace Bay's existing System 28000 line of high-speed switching hubs," said an analyst who was briefed on the announcement.

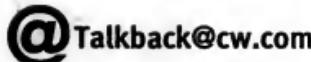
The 100Base-T hub comes with

two expansion slots that can be used for additional ports, a fiber uplink module or a network management card. The system is priced at \$2,375, roughly \$100 per port.

The Model 28000 LatticeSwitch Ethernet Switching Hubs provide switched Ethernet connectivity at 10M, 20M and 100M bps. These stand-alone switches deliver 2G bps of internal switching capacity.

Bay also intends to announce the BayStack stackable workgroup switch, which wasn't designed to replace the vendor's System 3000 bus.

The System 3000 was initially little more than a shared media hub but has evolved to support Ethernet switching.



**WE ASKED:** Is Microsoft coming to the Internet party too late to make a splash? Can it catch up with Net-scape? [CW, Oct. 2]

#### YOU SAID:

With the explosive growth of the Internet, there is plenty of room for Microsoft. I would love to have a browser that integrates with Microsoft Office, [Microsoft's] Visual Basic and all of the hooks in Windows.

Tom Power

[tom@tis.netcom.com](mailto:tom@tis.netcom.com)

I don't think Microsoft is late in this race. I have been using beta versions of Netscape and Internet Explorer 2.0 on Windows 95. Microsoft's Internet browser is very colorful in multimedia, and it is more stable than Netscape. I got a couple of things with Netscape while I was getting around the Web. I also feel that Microsoft comes in with a better way of doing price/performance things that may start the show. Usurp guys have wonderful ideas but complicating the implementation, whereas Microsoft simplifies like WYSIWYG in Word 95 for Internet publishing. I don't know how Unix folks used VI editor for that many years.

Bob Plesner

[plesner@pcc.bbn.com](mailto:plesner@pcc.bbn.com)

If you ask me, Microsoft does not have

the potential to start a name for itself with Internet software. I've been on the Microsoft Network (MSN). The user access is limited both physically and potentially in the sense that Microsoft is never in their field. MSN lets you use any Internet Web browser, such as Netscape or Mozilla. It gives access to those partners and allows to establish themselves on MSN.

Although Microsoft has established a name for it self in other areas of computer software, MSN is a ghetto for the "Internet ditzies."

Jeff Wood  
[jwood@redhat.com](mailto:jwood@redhat.com)

Look back at all the other areas Microsoft has entered. Microsoft starts out with weak products and gradually improves them, maintaining them with the skill of a master surgeon, in the process devolving market share. It will be the same with Microsoft's future Internet offerings. No one expects Microsoft "Anything." Version 1.0 to the mark, but given time Microsoft's products always prove themselves as viable alternatives, and if they don't, Bill Gates just buys the alternatives.

Everettw@redhat.com

## News Shorts

### Mystery glitch hits America Online

Unspecified technical problems at America Online, Inc. cut off an undetermined number of the service's 3.5 million subscribers from their electronic-mail capabilities last Wednesday. A spokeswoman for the Vienna, Va.-based on-line service provider said the problem was felt nationwide. AOL typically processes 4 million messages daily. "This isn't the first time I've had trouble with AOL service, but it hasn't been this severe before," a subscriber in California said.

### FCC to regulate frame relay

The Federal Communications Commission has decided to regulate frame-relay service. That means long-distance carriers must file frame-relay tariffs with the FCC. This year, AT&T Corp., Sprint Corp. and MCI Communications Corp. published rates, but they were as firm as sticker prices on a new car. The ruling will give access to frame-relay rates, and carriers will have to stick close to the tariffed rates.

### Sun slashes low-end prices

**S**an Microsystems Computer Corp. in Mountain View, Calif., cut prices last week on its low-end SPARCstation 4 Unix workstation and added an entry-level model at \$4,295 to compete with PC workstations.

### To Russia with IBM

IBM has won what is believed to be the first outsourcing contract of its kind in Russia. Under a five-year deal, IBM will build a data center in Moscow for The National Technology Co., which provides an automated share registration service for privatized Russian companies.

### Intergraph goes P6

**I**ntergraph Computer Systems in Huntsville, Ala., has announced new Intel Corp. P6-based workstations for three-dimensional graphics and engineering applications. The workstation will ship in the first quarter of next year.

### Free "net access on Quicken"

When San Diego-based Intuit, Inc. ships its Quicken for Windows 95 personal finance package early next year, users will get free but limited Internet access and a customized version of Netgear Communications Corp.'s Navigator browser, the company said last week. Intuit has signed a deal with Internet service provider Concentric Research Corp. to shuttle users directly to Intuit's new World Wide Web site at the click of a button.

### DataGuide support widens

Five vendors of key data warehousing products announced last week that their products are now integrated with DataGuide, a repository from IBM. DataGuide is LAN-based client/server software designed to serve an organization's centralized data warehouse. The companies are Pilot Software, Inc. in Cambridge, Mass., Arbor Software, Inc. in Sunnyvale, Calif., Business Objects, Inc. in Cupertino, Calif., Information Advantage, Inc. in Edina, Minn., and Vality Technology, Inc. in Boston.

### CNN/ATT unveil pact

**C**NN Interactive signed an exclusive deal with AT&T last week to provide business news on AT&T's Business Network on-line service, to be launched Nov. 1. AT&T, in turn, will create one-button links from Business Network to CNN's Web site.

### Clinton touts technology

President Clinton last week accused Republicans of risking the nation's technological future by seeking to cut federal research programs by a third in order to balance the budget. "We must strengthen, not weaken, our investments in science, technology and research," Clinton said.

### Digital rolls out TeamLinks

**D**igital Equipment Corp. last week announced shipments of Version 2.5 of TeamLinks, a desktop E-mail and file-access application suite for Windows and Macintosh clients connected to OpenVMS and Digital Unix servers. The latest version, which costs \$299 for the full suite, includes a remote access capability via modem or network card.

### CICS client goes beta

IBM plans late this month to start beta-testing client versions of its CICS transaction processing monitor with object-oriented interfaces and object class libraries. OS/2 and Windows clients will be supported initially, with general availability due early next year.

### IBM releases Ramac 2

IBM this week will announce general availability of its delayed Ramac 2 mainframe disk array, which is expected to spur further price reductions in that competitive market. Ramac 2 didn't ship in late August as planned because of a potential for buildup of hydrocarbon contamination in the array's new 4Gbyte disk drives.

### Eicon ships WAN software

**E**icon Technology, Inc. last week became the first internetworking vendor to ship products to enable Microsoft Corp. Windows NT servers to support stand-alone branch office routers. WAN Services for Windows NT, priced at \$305, enables the server to support IP routing over frame-relay leased and X.25 connections.

### Progress offers kit for Visual Basic

**P**rogress Software Corp.'s Crescent division in Bedford, Mass., this week will announce a kit to help developers get up to speed with Microsoft's Visual Basic 4. The VB4 Plus Pak will ship next month for \$49.95.

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There Seems To Be A Pattern Here.



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# Imaging and workflow for all

By Tim Ouellette

This week at Imaging Expo in New York, FileNet Corp. and Wang Laboratories, Inc. will reveal plans to provide users with one-stop shopping for imaging and workflow — from enterprise, high-vol-

ume systems on down to the desktop. Imaging software transfers paper documents to computer-based image files. Workflow software automates the movement of work items, which are often images themselves, around a company.

FileNet, which bought Watermark

Software, Inc. in Burlington, Mass., this summer, will announce a low-cost client based on Watermark technology for its back-end servers. The Costa Mesa, Calif., company plans to bundle a version of its workflow software with Watermark's imaging server. Watermark plans to enable

both firms' imaging servers to communicate with each other later next year.

Billerica, Mass.-based Wang will preview the integration of Microsoft Corp.'s Windows NT imaging software from Sigma Imaging Systems, Inc., a firm Wang purchased in June, with Wang's OpenImage and OpenWorkflow products. This move heralds a push into the workflow space from Wang's previous focus on high-volume, high-end systems (see related story, page 12).

## Anticipation

FileNet users said they would look forward to low-cost, entry-level clients.

"We have departments that don't need the full heavy-duty workflow effort" provided by high-end FileNet systems, said Karen Weisbar, manager of image technology at the Public Employees' Retirement Association in Denver and president of the FileNet user group UserNet. For the more casual user of imaging and workflow in a company, the Watermark integration will provide an easy way to get at data in a high-level system without a lot of customization, she added.

Bankers Trust Co. in New York will comes the client software because it had already been trying to get Watermark to work with FileNet's strong back-end servers with the help of an outside consultant, said Laura DeGaudio, technical architect for electronic document management.

To target low-end, low-volume imaging and workflow users, Wang plans to include a free image viewer as a feature of Windows 95 in future upgrades, according to Wang President/CEO Don Casey.

 Spalding Sports uses imaging to reduce its product development cycles. See page 57.

## Image makers

**A**lso at Imaging Expo, Optikta Imaging Systems, Inc. will announce a product suite aimed at workgroups.

The low-cost software suites, based on the Colorado Springs company's core set of imaging and storage ware, can then scale up for the enterprise.

"Optikta has proven that starting from within works," said Paula Boyle, an analyst at BIS Strategic Decisions in Norwell, Mass. Traditionally, she said, the vendor has gone after the high-volume, highly structured, paper-intensive processes very well while forgoing low-volume, ad hoc installations.

Retailer Eddie Bauer, Inc. in Redmond, Wash., started with an Optikta system in accounts payable. That system spread to three other high-volume administrative units, said Kim Affleck, manager of financial disbursements.

— Tim Ouellette

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# Compaq stilleyes the 'prise

Firm signs up Tandem, DEC to fill enterprise gaps, build server clusters

By Jaykumar Vijayan and Michael Goldberg

**C**ompaq Computer Corp. is teaming with big-name vendors Tandem Computers, Inc. and Digital Equipment Corp. to help plug some key gaps in its strategy to reach the enterprise computing market.

The moves are expected to strengthen the company's bid for the midrange segment currently owned by minicomputer vendors such as IBM, Hewlett-Packard Co. and Digital. But observers cautioned it will be a while before the Houston company actually gets there.

"Compaq has correctly realized that it is going to take some really high value-add products and services, even if they are from competitors," in its bid for the midrange market, said Thomas Kucharczyk, president of Sunmi Strategies, Inc. in Boston.

Compaq and Tandem, based in Cupertino, Calif., last week announced they will jointly develop Peripheral Component Interconnect cards and routers based on Tandem's ServerNet architecture to build Microsoft Corp. Windows NT-based clusters of Compaq servers.

ServerNet is a proprietary technology designed to increase the speed at which data passes between interconnected computers, communications controllers and peripherals. This technology is vital to Compaq's long-term strategy to build highly available, fault-tolerant yet relatively inexpensive clusters of interconnected servers that can run giant database applications, analysts say (see chart).

Compaq hopes to use such Windows NT-based server clusters, or arrays, to compete with its traditional minicomputer rivals. Compaq's first four-node cluster, based on Intel Corp.'s 486 chip, is due late next year.

Meanwhile, Compaq's partnership with Digital is expected to provide sorely needed enterprise-level service and support capabilities. Digital will provide global support for all Compaq products.

Some users at last week's Compaq-organized InFocus Forum '95 in Houston applauded the company's latest moves. "I think they are positioning themselves as a real player in the distributed computing marketplace of the future by covering all their bases," said Harry Sunshine, vice president of information at Kraft Canada, Inc. in Don Mills, Ontario.

The kind of capabilities and the technologies Compaq is adding are "certainly where the fu-

Compaq's clustering route	
Standby Recovery Server for Windows NT and NetWare	Q3 1995
On-Line Recovery Server for Windows NT	Q2 1995
Oracle support for On-Line Recovery Server	Q4 1995
Microsoft SQL transparent client reconnect for On-Line Recovery Server	Next release of Microsoft SQL Server
Oracle automatic reconnect for On-Line Recovery Server	First half 1996
Tandem ServerNet interconnect for scalable Windows NT Server database clusters	Q4 1996/Q3 1997

ture is headed," said Thad Mauldin, executive director of the U.S. Space and Rocket Center in Huntsville, Ala.

But Compaq still must close some vital gaps for its enterprise strategy to succeed, analysts said. By far, the most important need is software to hold together the disparate hardware elements of a clustered server architecture. The Tandem alliance will provide the physical connectivity, but Compaq still will have to wait for the operating system and application software components to fall into place.

Compaq and Tandem already are working with Microsoft to help design a clustering application programming interface (API) for Microsoft's Windows NT and BackOffice. Such an API won't be available to application developers until well into next year, however.

 **Hewlett-Packard** is launching a program to buy back any brand of PCs. See page 50.

# Wang users cheer VS developments

## Product upgrades sustain user base

By Neal Weinberg

BENEFIT: MASS.

The Wang Laboratories, Inc. user group may be dead, but its members are still kicking.

Last week, Wang's VS users said they felt like they won a new lease on life when the company announced new products and upgrades to the proprietary minicomputer line.

At a company-sponsored show called InterAction, Wang said it was building a CMOS chip for a high-end VS 16000 box that will be available late next year. Wang also announced new tape and disk drives and connectivity software.

Users who fled by the company through its 1992 bankruptcy filing said they were relieved that Wang seemed to be back on its feet financially and continuing to support its VS base. Many were moving applications off the VS system but wanted to migrate on their own terms.

Don Travis, information systems supervisor at Churchill County Telephone Systems in Fallon, Nev., said that even though he doesn't plan to buy a 16000, he is pleased that Wang is developing it.

"I think they're doing a great job having us believe that VS base and maintaining a high level of customer satisfaction," Willmott added.

Quill Co. plans to use a Wang VS and a Novell, Inc. LAN for the next three years and then migrate completely off the VS, said Manuel Silva, data processing manager at the Cranston, R.I.-based prep company.

Silva said he appreciates Wang's offering users help in formulating their migration strategies, rather than fighting the tide of defections to open systems.

The company's Customer Services Business offers network integration consulting services for VS customers. In addition, Wang continues to develop software for connecting VS systems to PC LANs.

Users gave the following reasons when asked why they are staying with Wang technology:

**"There's no reason to change. The stuff just works."**

— Christopher Izzo, technical operations analyst, Healthcare Underwriters Mutual Insurance Co., Latham, N.Y.

**"Nothing else made sense."**

— Carol C. Clarke, systems analyst, Baptist Life, Buffalo, N.Y., who decided after looking at alternatives costs to stick with VS and upgrade the system.

**"We'll keep it until we're compelled to leave."**

— Don Travis, IS supervisor, Chittenden County Telephone Systems, Palermo, Nev.

"We still run it forever," said Christopher Izzo, technical operations analyst at Healthcare Underwriters Mutual Insurance Co. in Latham, N.Y. But rather than buying new VS models, Izzo said his game plan is to wean applications off the VS.

After investigating alternatives to the VS, Cora C. Clarke, a systems analyst at Baptist Life, an insurance company in Buffalo, N.Y., decided to upgrade rather than migrate. "We didn't see anything else that will do what we want," she explained.

Eventually, she said she plans to connect the VS system with a PC-based LAN, but the Wang box will be around "for the foreseeable future."

The Wang users who attended InterAction didn't seem bothered by the fact that the event was company-sponsored, not user-powered. The International Society of Wang Users went out of business over the summer because of declining membership.



**Compaq's CEO Eckard Pfeiffer** described the moves as an effort to pull together "the key elements needed to make the 'distributed enterprise' work," and to provide users with a "supplier who could pull all the best-of-breed pieces together and orchestrate the entire solution."

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The kind of capabilities and the technologies Compaq is adding are "certainly where the fu-

**FUNCTIONS:** Data processing, application server  
**PRODUCT DELIVERY:** Late 1996  
**MICROPROCESSOR:** CP-16; 5-micron chip design  
**CACHE:** Two-level  
**CAMP DATA TEST:** First-quarter 1996  
**CAMP DELIVERY:** Second-quarter 1996  
**PRICE:** Not available



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## Internet services

# In 'net we trust

Users deposit faith in first on-line-only bank

By Thomas Hoffman and Kim S. Nash

**Security First Network Bank, SFNB (SFNB)** could become the Microsoft Corp. of the virtual banking community.

That is what analysts and users were saying last week after SFNB became the nation's first Internet-based bank to open its cyberdoors for business. SFNB, an Atlanta-based subsidiary of Cardinal Bancshares, Inc., began offering customers the ability to write electronic checks, make deposits and pay monthly bills online (<http://www.sfnb.com>).

Erie Walter, a 27-year-old customer support specialist at MCI Communications Corp. in Atlanta, was the first customer to log in through SFNB's virtual pillars at 12:01 a.m. last Wednesday. "I was徜ampting at the bit," said Walter, who intends to use the service at home and at work using his IBM/7550CD laptop.

Like many skeptics, Walter had some

butterflies about transferring his funds over the Internet. "But after studying what SFNB did with their cryptography and firewalls, I felt comfortable," said Walter, who is considering transferring all of his bank accounts from Wachovia Corp. to SFNB.

Wachovia and Huntington Bancshares have invested in SFNB and plan to license the same Fire Pages, Inc. Virtual Bank Manager software that SFNB uses. FPI Pages tapped SecureWare, Inc. and Hewlett-Packard Co. to develop a multilayered security system that uses the same technology. Atlanta-based SecureWare developed for the U.S. military and intelligence agencies.

SFNB's Atlanta data center will handle customer traffic using three HP 9000 servers running HPUX and its HPUX Trusted Operating System. SFNB will route customer transactions over 50K public lines to M&I Data Services in Mil-

waukee, which in turn will process deposits, checks and wire transfers using its Integrated Banking System.

"I think larger banks approach privacy when it comes to developing a secure means of conducting electronic commerce," said Michael Brown, a vice president at The Dove Group, Inc., an Atlanta banking and financial services consultancy. SFNB "has taken the risk out of on-line banking with their security architecture," Brown said.

While some 215 banks have set up some form of Internet access or World Wide Web pages, SFNB stands alone in providing full-service on-line banking. BankAmerica Corp. for example, upgraded its Web site last week to include

online credit-card and loan applications. But BankAmerica said it doesn't offer full-fledged on-line transactions.

**& A tool from an Australian firm helps companies get up on the Web. See page 90.**

## Spider spins out tool kit to improve database/Web link

By Kim S. Nash

**Spider Technologies, Inc.** today begins shipping a World Wide Web development tool kit designed to address the growing problem of connecting on-line applications to information stored in legacy corporate databases.

But 5-month-old Spider isn't the only company rushing to fill the dead air that often exists where a database/Web link should be.

Oracle Corp., Next Computer, Inc. and a host

of other companies have announced or started shipping such products (see chart).

### Looking ahead

Lockheed Information Technology Co. for example, wants to put internal telephone directories on-line, using an Oracle or Sybase, Inc. database on the back end and a Netscape Communications Corp. browser on the front end.

"We're hoping to see a lot of this integrated in browsers, servers and other products in the future but to such luck so far," said Art McNamee, a senior programmer analyst at the aerospace company in Denver.

Spider hopes to take advantage of that need with Spider 1.1, a tool set designed not only to help users build programs to run on Web servers but also to access information in databases from Informix Software, Inc., Oracle and Sybase.

Informix, Oracle and Sybase have teamed up with Spider to support Spider 1.1, but the Big3 database makers each plan to release their own Web/database middlewares sometime next year.

Spider Chief Executive Officer Zack Rinaldi said he feels the heat. "but we are there [with products shipping] right now. They're not."

A free beta-test version of the product has been available from Spider's Web site since August (<http://www.w3spider.com>).

of other companies have announced or started shipping such products (see chart).

"People are waking up to the fact that this kind of communication is absolutely critical" for internal and external Web sites, said Greg Cline, an analyst at Business Research Group in Newton, Mass.

The most urgent need for database/Web links is among users building applications for inter-

## On-line expo covers gamut

By Kim S. Nash

Like the "net itself, next week's Internet World conference in Boston is expected to vibrate with chaos. New product announcements touching virtually every aspect of building, managing and milking on-line applications are expected.

It will be a highlight with a handful of announcements including plans to unveil a hardware/software World Wide Web server bundle that runs on the OS/2 Warp operating system, an IBM invention.

Also expected are details about how AS/400 minicomputers can be used as Internet servers.

Elsewhere in the Web server sector, Mountain View, Calif.-based Connect, Inc. is expected to announce an electronic-commerce product to round out its line of servers. The WebGuy Group, Inc., in Palo Alto, Calif., plans to announce an upgrade to its Embassy server and tool kit.

Attendees at the show, which is sponsored by Westport, Conn.-based Mecklermedia Corp., will be able to see an early version of FTP Software, Inc.'s Review utility. Similar to Adobe Systems' Inc.'s Acrobat, the product lets users view documents in file formats without running the application in which the files were created.

For novice Web developers, AdvoNet has planned a pair of two-hour how-to sessions to teach the basics of building on-line applications. Participants will come away with the beginnings of their own home pages, a spokeswoman said.

Curious about who, how and why of Internet usage? CommerceNet, a Menlo Park, Calif.-based consortium of 140 vendor and user companies, is pushing the idea of electronic commerce, plans to reveal the results of a three-month survey of Internet users and applications.

Other key announcements include the following:

■ Software.com in Santa Barbara, Calif., will unveil PostOffice. The \$500 product supports Simple Mail Transfer Protocol and Post Office Protocol. The package, which runs on Microsoft Corp.'s Windows NT and Sun Microsystems, Inc.'s Solaris and Solaris, costs \$500 per server with no per-user fees.

■ Yahoo! Unplugged, a book of tips and tricks for using the popular Yahoo! Web search site, will be unveiled by IDG Books, a unit of Prima Publishing. Mass.-based International Data Group.

■ An auditing product for monitoring internal and external corporate Web sites is expected from Internet Profiles Corp. in San Francisco.

Surfing the database		
VENUE	PRODUCT	AVAILABILITY
Microsoft Mt. Laurel, N.J.	SapphireWeb	Shipping
Early Santa Clara, Calif.	Electronic Workforce	Shipping
Midsoft Vienna, Va.	HardServer	Shipping
Next Redwood City, Calif.	WebObjects	First quarter next year
Oracle Redwood Shores, Calif.	Yet to be named	Early next year

of other companies have announced or started shipping such products (see chart).

"People are waking up to the fact that this kind of communication is absolutely critical" for internal and external Web sites, said Greg Cline, an analyst at Business Research Group in Newton, Mass.

The most urgent need for database/Web links is among users building applications for inter-

# Notebook vendors target the high end

Toshiba, HP and NEC to introduce expensive, multimedia Pentium portables

By Mindy Blodgett

Users of premium multimedia notebooks now have more to choose from thanks to new products on the way from three leading portable makers: Toshiba America Information Systems, Inc., Hewlett-Packard Co. and NEC Technologies, Inc.

The snazzy offerings, all built around Intel Corp.'s recently announced 120-MHz Pentium processor, join an increasingly crowded field, according to industry observers.

The feature-rich notebooks are aimed at replacing desktops. They cost from \$5,000 to just under \$7,000, which puts them out of the reach of most users.

"These machines are fabulous pieces of engineering," said Mike McGuire, an analyst at Datapoint, Inc. in San Jose, Calif. "The bottom line is that we would all love to have a Ferrari, but most of us have a Mazda in the driveway."

#### More options

The slate of new notebook announcements includes the following:

- This week, HP will announce the HP OmniBook 5000 CTS 5/120 PC and a docking system for its entire range of OmniBooks, including notebooks with 75- and 90-MHz chips. HP also has incorporated lower-priced portables into the line. The

Omnibook 5000 CTS 5/120 is based on the Peripheral Component Interconnect bus and offers accelerated graphics and performance; a 10.4-in. screen and a price tag of \$6,500. The OmniBooks

#### On the move

Gartner Group, Inc., predicts that notebooks and industrial handhelds will lead the main growth area for mobile computing through 2000.

will ship in early December.

- This week, NEC will announce the Versa #600 notebook, also powered by the 120-MHz Pentium. The machine, which will ship later this month, will feature a slot that gives users the option of adding a CD-ROM drive, a second battery or a second hard drive. It also offers a recessed keyboard, palm rest and touchpad pointing device. It will cost \$5,499.
- Toshiba last week announced its long-awaited high-end offering, the 700 Series, which comes in two models, the 700CS and the 700CT. Both are equipped with the 120-MHz Pentium chip. The series offers an 11.3-in. thin film transistor active-matrix screen, removable hard drive and a docking station. Pricing wasn't available, but the notebooks will ship early next month.

The plethora of multimedia notebooks offers real advances in notebook technology, industry analysts said.

Bru Andrew Seybold, editor of "Out-

look on Communications and Computers," said the recent focus on high-end notebooks is leaving mobile users merely seeking fast connections to the

office out in the cold.

"These are desktop replacements, not true portables," Seybold said. "There is a whole group of people out there who

just want information access and communications, not multimedia for presentations." But McGuire said the advanced technology used to create the notebooks will trickle down to the value end of the market. "These advances will benefit all portable users eventually," he said.

## What Do

# Novell, Corel and Silicon Graphics

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## News

# Interoperability pact between CDPD carriers eases access

By Mindy Bladgett

The ease and availability of wireless access took another step forward last week with announcements from GTE, Mobilex, Inc., and Bell Atlantic-Nynex Mobile.

The two Cellular Digital Packet Data (CDPD) carriers are offering customers access to each other's networks thanks to an interoperability agreement. CDPD is a mode of transmitting data over a wireless network via the Inter-set Protocol.

Starting immediately, a GTE customer in the carrier's Houston market, for instance, can access Bell Atlantic's network in Connecticut and vice versa.

"This will make roaming—or 'visiting,' in carrier parlance—much easier."

## Service availability

Initially, the service will be available to customers in Bell Atlantic's Connecticut system and to GTE customers in all markets. However, the agree-

ment covers future markets for both carriers as well.

Each network will set its own rates, but users will receive a single bill from the user's home carrier.

### Seeing the future

Such interoperability agreements are vital to the future of wireless and CDPD, industry observers said.

"One of the shortcomings of CDPD currently is the lack of interoperability," said Robert Hirsh, director of wireless data at Bell Atlantic-Nynex Mobile in Bridgewater, N.J.

"Providing that is a way of providing a nationwide network."

The most recent interoperability compact is the second for Atlanta-based GTE, which reached a similar agreement with Ameritech Cellular Services in July. The GTE/Ameritech agreement was the first in the industry.

Further interoperability agreements are on the horizon. CDPD carriers say "There will absolutely be more such agree-

ments," Hirsh said.

In other wireless news, AT&T Wireless Services' Wireless Data Division in Kirkland, Wash., formerly McCaw Cellular Communications, Inc., announced last week that it is offering circuit-switched cellular service in New York and New Jersey. Circuit-switched cellular is a technology enabling users to send data over cellular links using a cellular modem.

Simultaneously, AT&T announced CDPD service in New York City. Bell Atlantic Mobile also offers coverage there.

### Here it works

Both CDPD and circuit-switched cellular use the cellular network to send data over cellular links. But circuit-switched data uses a dedicated wireless connection. CDPD, on the other hand, adds packet data capabilities to cellular networks and doesn't require a dedicated line.

Short, bursty file transactions are better for CDPD; longer file transfers are suited to circuit-switched cellular.

Bell Atlantic and GTE offer circuit-switched cellular in their markets as well.

switching should move to Oneore.

And although 3Com plans to offer users of Chipcom's popular Galactic switching system incentives to migrate to Oneore, some users won't budge. Galactic will be sold, serviced and supported but gradually phased out, 3Com said.

"We've got multiple Galactics and love them to the point that we'd buy new ones up until the very last day they're set," said one network manager who requested anonymity. "The technology is outstanding, so we have no plans to move to other switching hubs."

Analysts said users should turn up the heat on 3Com to make good on promised enhancements to products that are being phased out and press the vendor to provide other features to maximize their current investment.

"Users need to do themselves a favor and, instead of panicking, let 3Com know what they want and what they need," said Mary Petrusky, a senior analyst at The Burton Group, a consulting firm in Salt Lake City. "It's not 3Com's plan to leave anyone high and dry."

# MCI services enable remote user dial-in to frame-relay networks

By Neal Weinberg

MCI Communications Corp. last week introduced a broad set of services that allow telecommuters and traveling salespeople to dial in to their company's corporate frame-relay network from laptop computers.

Remote access in frame relay isn't new, but MCI said the company's goal is to give remote workers access to the same applications as people at corporate headquarters.

Herrick said remote access to frame relay represents "a huge market opportunity," especially at companies with large mobile sales forces.

### Benefits abound

The service would be a major benefit to companies with telecommuters, said Jim Garlione, manager of network services at United Technologies Corp. in Hartford, Conn.

Garlione also said the ability to establish an Integrated Services Digital Network (ISDN) link to the frame-relay network provides an additional benefit because ISDN has the flexibility to carry voice, video and data. MCI said it will offer that capability in mid-1996.

Herrick said that in addition

to individual users, the MCI service would be suited for small branch offices that can't justify the cost of a dedicated frame-relay connection yet need more than simple modem access to the network.

John Dex, product marketing manager for data access services at MCI, said the company's goal is to give remote workers access to the same applications as people at corporate headquarters.

Herrick said remote access to frame relay represents "a huge market opportunity," especially at companies with large mobile sales forces.

In addition to giving remote workers greater access to applications, the dial-in option saves money because users can get onto the network through a local call instead of having to dial long-distance, Herrick said.

As part of the service, MCI offers connections to Telnet servers over an 800 line. It also provides a connection between X.25 and frame relay for mid-size companies with X.25 serial ports in countries where frame relay isn't available.

## 3Com

CONTINUED FROM COVER I

pose switching hub angered some users who invested in 3Com switching products.

"This is a very unfortunate and illogical decision," said Steve Lopez, a network manager at the National Board of Medical Examiners in Philadelphia, a longtime 3Com customer. "Chipcom products can't hold a candle to 3Com's switching systems. 3Com's technology is far superior."

Lopez has roughly \$250,000 invested in six 3Com LANplex 6000 switches. "We want [3Com] to focus on enhancing and evolving these switching hubs," he said.

John Boyle, 3Com's vice president of business development, stressed that the company will continue to enhance, service and support its LANplex and Complex switches for at least five years. He added that users looking for breadth in



**Steve Lopez:** Not every user can afford to buy Oneore's integrated net management system

its network management plans for Unix platforms in the second half of next year (see chart).

This is a key area because many Chipcom switching hub users have several versions of 3Com's inter-networking equipment.

"I'd really like to see 3Com working on integrating the two packages for use on a Windows platform," said Steve Plus, network manager at MetroWest Medical Center in Framingham, Mass. "Using different icons for each package on a common workstation is OK, but the real benefit would be integrating things like alarm notification as soon as possible."

Boyle said providing managementware on PC platforms is part of 3Com's plan, but he wouldn't say when users could expect them.

Chipcom users questioned 3Com's distribution strategy, which calls for 3Com to sell its products through Chipcom's

3Com also detailed its network management plans for Unix platforms in the second half of next year (see chart).

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Chipcom users questioned 3Com's distribution strategy, which calls for 3Com to sell its products through Chipcom's

### Phase 1: Full integration

**Phase 1** 3Com will ship its Transcend Enterprise Manager with Chipcom's OnDemand Network Control System for use on a common Unix workstation. The systems can be run concurrently as separate icons (similar to Excel and Word on the same platform).

### Phase 2: Multiplatform support

**Phase 2** 3Com's objective is to provide management for devices with basic compatibility such as the two companies' virtual LAN schemes.

### Phase 3: Integration of the two packages

**Phase 3** Full integration of the two packages

Source: 3Com Corp., Santa Clara, Calif.

partners. But 3Com will not sell Chipcom products through its own distribution channels.

"There could be channel conflict as a result, because in some cases, there are many distributors that already sell 3Com gear," said Alan Robeson, director of information services at Val-Pak Direct Marketing Systems, Inc. in Largo, Fla.

Boyle said 3Com's goal "is to minimize channel pain."

The largest ATM trial currently underway goes live in February. See page 67.

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## News

# Spectrum gears up for management test

By Patrick Dryden

After months of preliminary testing with key users, Cabletron Systems, Inc. froze the code last week for Version 4.0 of Spectrum enterprise network management software, stopping the clock on all fea-

tures and enhancements in order to ship the version early next year.

Beta testing will start next week, and the new version should ship on Microsoft Corp.'s Windows NT and multiple Unix platforms in the first quarter of next year, as expected [CW, Sept. 4].

Many administrators are eager for a version that can run on a PC platform and without Unix expertise. They want to see for themselves, however, if Spectrum on Windows NT really can handle the monitoring and database demands of their networks.

"With the NT option we can match the right tool to the right location, cutting our overall support costs, because [NT systems] tend to be easier to manage than Unix systems," said John Bullivant, vice president of corporate technology at J.P. Morgan & Co., the New York-based financial giant. "But it's too early to gauge this version's price-performance," he said.

Intel-based PCs certainly are cheaper than the IBM RS/6000 workstations we ran Spectrum on now, but I don't know yet if an NT system is powerful enough to monitor the 2,200 devices on our network," said Kevin Blackburn. He is a senior telecommunications specialist at Time Customer Services, the division of Time Warner, Inc. publishing that handles logistics for magazines and company networks.

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Major improvements take Spectrum to the next level of scalability. Version 4.0 already has been praised by analysts and managers of huge networks for its distributed management capability. It will let managers unify functions across multiple domains.

Users will be able to view the entire network at once instead of server-by-server for each management domain. Users will be able to consolidate alarms, run a single application and generate reports based on data exchanged among all Spectrum servers.

This enterprise-wide vision appeals to early testers at Texas Instruments, Inc. and the U.S. Postal Service, where extensive networks with distributed Spectrum servers require central monitoring and re-load support.

Blackburn also looks forward to Version 4.0, even though his group runs only two Spectrum servers. "We want to be able to synchronize alarms and combine reports so we can monitor around the clock, after the New York office closes," he explained.

Pricing for Version 4.0 will start at \$15,000 for one server and one monitor, for Windows NT or any of five Unix versions.

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This new experimental operating system, an unsupported product from AT&T Bell Laboratories, provides a network-based computing environment uniting hardware platforms from PCs to RISC multiprocessors. Plus, its shared distributed computing and file storage services make a network of diverse computers work like a single communal system.

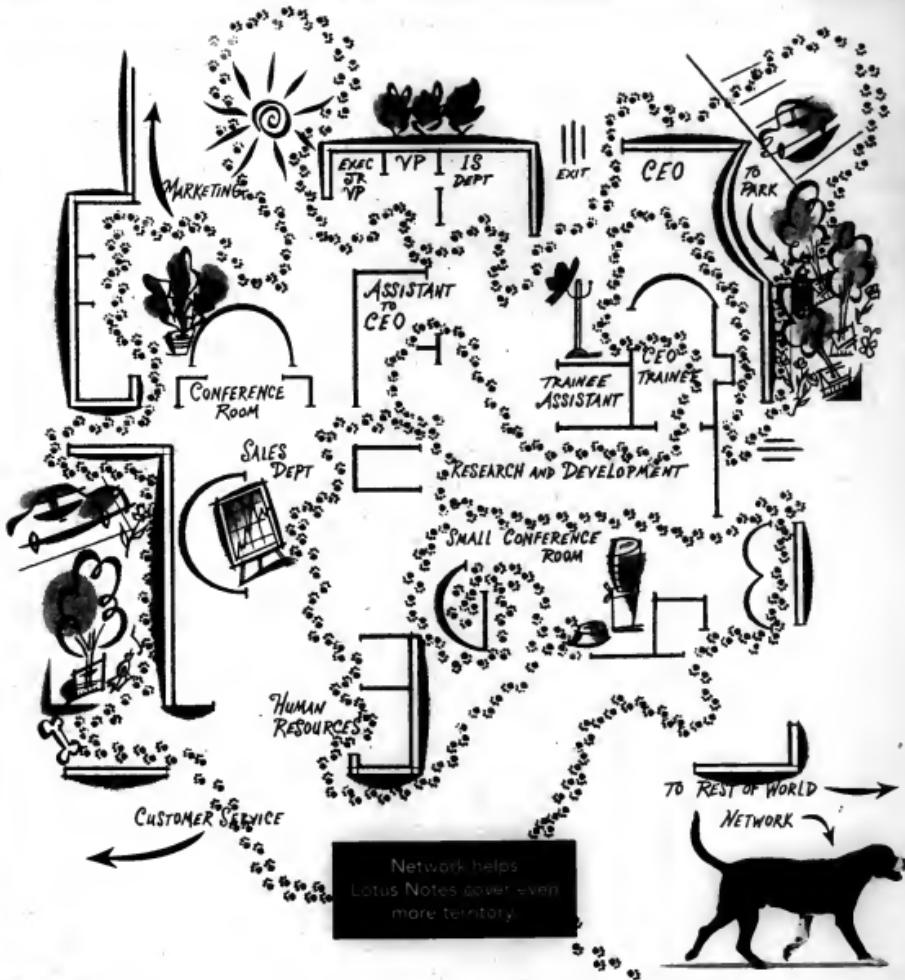
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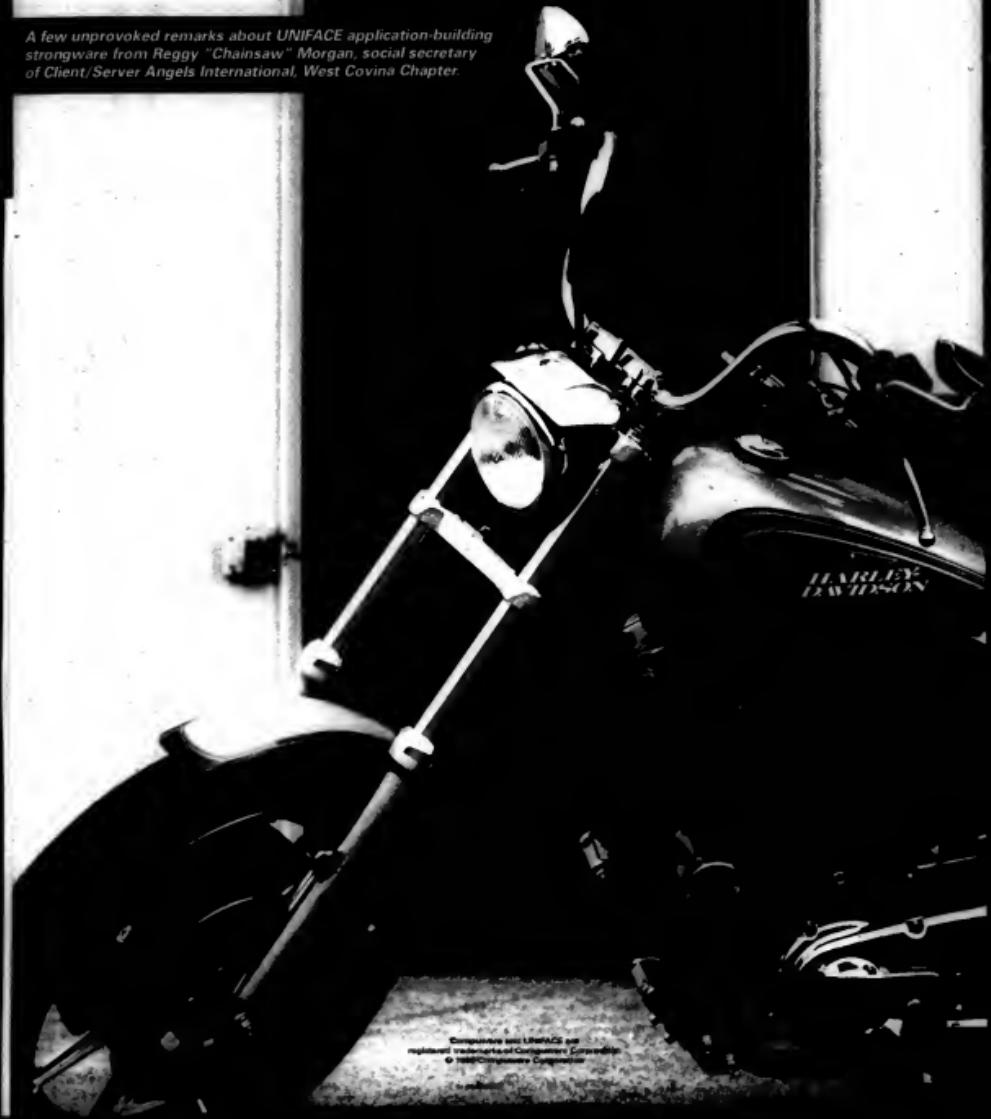
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*A few unprovoked remarks about UNIFACE application-building  
strongware from Reggy "Chainsaw" Morgan, social secretary  
of Client/Server Angels International, West Covina Chapter.*



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word about UNIFACE yet let me urge  
you to call 800 365-3608 or I might  
have to introduce you to my  
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UNIFACE APPLICATION DEVELOPMENT STRONGWARE



## News

# Piecemeal outsourcing on the rise

By Craig Stedman  
ORLANDO, FLA.

Selective outsourcing is getting even more selective.

Companies are increasingly seeking outside help as they struggle to cope with

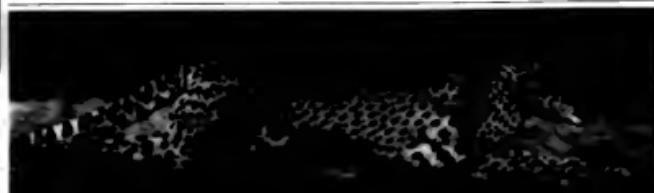
the new math of client/server. As part of that trend, the concept of selectively outsourcing pieces of the data-processing equation has emerged in the last few years as an alternative to handing over everything to outsiders. But now, information systems executives in many

cases are looking at outsourcing just pieces of the pieces, according to users and analysts at Gartner Group, Inc.'s Symposium conference here this month.

This approach, labeled "out-tasking" by one Gartner Group analyst, lets organizations retain control over key functions such as application development and help desks. But the organizations can then use outsourcing vendors to augment internal skills or off-load repetitive tasks such as PC upgrades.

Deanne Levandowski, manager of programming and development at Sanofi Diagnostics Pasteur, Inc. in Chaska, Minn., said the maker of medical testing products may outsource the process of upgrading, changing and moving PCs to free up its help desk.

"Because the help desk is getting hung up in some of the manual tasks, we aren't able to give users the kind of service we want to," Levandowski said. As a result, the company's quality of service is rated as "good but declining," he added. Sanofi also is considering moving all of its processing to Unix systems, and such a move could create a need for outsourcing help in application development, Levandowski said.



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David Steele, Internet Publishing Consultant,  
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Telnet and Rlogin  
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Gartner Group analysts made the following projections about outsourcing trends at the recent Symposium conference:

- 75% of companies will selectively outsource end-user computing tasks within three years
- 70% of outsourcing customers will demand value-added services, rather than cost-cutting, by 1997
- 20% of outsourcing deals will involve application development or maintenance by 2000
- or more of all help desks will use outsourcing vendors within three years
- 50% of the help desk deals will be to assist internal workers rather than replace them

Source: Gartner Group, Inc., Stamford, Conn.

Colleen McCormick, an analyst at Gartner Group in Stamford, Conn., said outsourcing vendors likely will be involved with almost half of all help desk deals within three years. But most of the deals are expected to augment internal help desks rather than replace them, she said (see chart).

A key change wrought by this approach is that cost reduction becomes less of a motivator as outsourcing moves down to the bits-and-pieces level. Instead, the ability to tap into skills that internal IS shops can't or don't have time to provide themselves gains importance, conference attendees said.

"Within our IS budget, we probably can't save money" by outsourcing a subset of help desk tasks, said Bill Flowers, director of academic computing and user services at Seattle University. "But there's an intangible kind of savings if [end users] will be happier and more productive."

The college ended a wholesale outsourcing deal three years ago and brought IS back in-house. But it is again looking beyond the walls of academia for assistance with tasks such as PC repair and help-desk support of its legacy systems and Macintoshes, Flowers said.

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# Computer Industry

Financial results for third-quarter 1995

	REVENUE		PERCENT		PROVISIONS		PERCENT	
	1995	1994	CHANGE	1995	1994	CHANGE	1995	1994
Apple Computer, Inc.	\$3B	20%		\$60M	NM		-48%	
AT&T Corp. <sup>1</sup>	\$19.7B	5%		\$262M	75%			
Compaq Computer Corp.	\$5.6B	28%		\$245M	22%			
Computer Associates International, Inc. <sup>3</sup>	\$812M	36%		\$637M	NM			
IBM <sup>2</sup>	\$16.8B	9%		\$538M	NM			
Informix Corp.	\$180M	54%		\$25.3M	52%			
Intel Corp.	\$6.17B	46%		\$930M	41%			
Microsoft Corp.	\$2.02B	62%		\$499M	58%			
Sun Microsystems, Inc.	\$1.49B	17%		\$86.7M	121%			
Sybase, Inc.	\$233M	27%		\$1.1M	-94%			

<sup>1</sup> IBM = Net revenue<sup>2</sup> Includes one-time restructuring charge<sup>3</sup> Includes one-time charge for Legend<sup>4</sup> Includes one-time charge for Lotus

## Big hitters post big gains with third-quarter results

By Computerworld staff

Computer industry bellwethers reported strong gains in the third quarter, though the biggest one of all, IBM, took a larger-than-expected hit for its purchase of Lotus Development Corp. this summer.

Even so, investors responded by driving stock prices up across the technology sector.

Wall Street had previously responded to this summer's strong results by damping technology stocks (CW, July 24). This was, in part, due to attempts by IBM and Microsoft Corp. to downplay their future earnings.

There was no need for Microsoft to worry, though. The Redmond, Wash., company reported that sales for the third quarter, traditionally its slowest of the year, turned out to be its best quarterly results ever. Revenue was fueled by much-higher-than-expected sales of Windows 95 and Office 95.

### Lotus drags IBM down

On the other hand, after a string of bang-up quarters, IBM lost some steam as hardware revenue flattened because of various product delays and component shortages. A \$1.9 billion charge to cover its summer acquisition of Lotus produced a net loss for IBM.

However, its third-quarter operating profit, before the charge, doubled last year's figure and fell just shy of Wall Street forecasts.

Delays in IBM's AS/400 development also caused software sales to come in lower than expected, said Gary Helman, a financial analyst at Soundview Financial Group in Stamford, Conn. And the IBM PC Co. reverted to single-digit revenue growth to drag down the company's hardware gross margins, thanks to sluggish sales growth in Europe and the U.S. and coupled with price cuts in its profitables line.

"This was a step backward" for the PC Co., Helman said.

Richard Thoman, IBM's new chief financial officer, confirmed expectations that additional layoffs are

planned for the current fourth quarter. Thoman didn't say how many of IBM's 225,000 employees will get the ax, but analysts said they expect the company to chop 5,000 to 10,000 people.

Despite posting its best sales figures ever, IBM partner Apple Computer, Inc. fell prey to component shortages and order backlogs, which in Apple's case hovered around \$1 billion. The Cupertino, Calif., company was also hurt by dependence on sales of low-margin Macintoshes, which resulted in a lower profit than last year, analysts said.

AT&T Corp. also suffered reduced profits after taking a charge to restructure its computer manufacturing operation. The charge will pay for the elimination of 7,200 jobs and 1,300 contractors.

Meanwhile, exactly 10 years after the introduction of its first 68030 chip, Santa Clara, Calif.-based Intel Corp. continues to have record quarter after record quarter, fueled by accelerating acceptance of the Pentium processor among both home and corporate buyers.

Among PC makers, Compaq Computer Corp.'s sales boomed again, and inventory increased to \$2.3 billion from just over \$2 billion last year. According to company officials, this is just a buildup for the fourth quarter, traditionally the busiest selling season of the year.

Internet use and growing user interest in networked servers helped boost sales and more than double profit for Sun Microsystems, Inc., company officials said. Sun Chief Financial Officer Michael Lehman also said Sun sold more high-margin multiprocessor servers in the quarter.

Thanks to increased sales of its midrange software, including CA-Unicenter, Computer Associates International, Inc. also exceeded analysts' earnings forecasts. Though the Islandia, N.Y.-based company's operating profit increased 31% from the same period last year, CA — much like IBM — took an \$808 million after-tax charge associated with its recently completed acquisition of Legend Corp. That resulted in a loss.

## AT&T seeks to divest itself of Paradyne

Sale of profitable unit puzzles users

By Bob Wallace

AT&T Paradyne Corp., the vaunted data networking equipment arm of AT&T Corp., last week became the first casualty of the telecommunications giant's recent breakup when the parent company announced plans to sell the Largo, Fla., firm.

"By separating Paradyne from AT&T's other equipment businesses, Paradyne avoids possible conflicts in selling to AT&T's competitors," an AT&T spokesman said.

AT&T wouldn't say if it has a buyer for Paradyne, which has roughly 1,300 employees and had an approximate revenue of \$300 million last year. Analysts say they haven't seen signs of any potential suitors.

An AT&T spokesman claimed that Paradyne, which AT&T acquired in 1989, has been profitable since 1990. But he wouldn't say if the company would turn a profit this year.

Analysts said the company has been badly mismanaged, though AT&T denied that.

### What happened?

"They had everything going for them," said Maribel Howard, a research analyst at International Data Corp. in Framingham, Mass. "They had a solid revenue base, the AT&T name behind them, and they were innovators with high-quality products. Their management team screwed up big time."

Users were left scratching their heads.

"Their products work great, and their technologies are innovative," said a network manager at one Florida-based firm who requested anonymity. "I'm baffled by this." He agreed that the company wasn't managed well.

The spokesman said a sale "would put Paradyne in the best position to explore relationships with existing customers and explore new opportunities with its leading-edge technologies" but would elaborate.

Paradyne pioneered two key technologies that work over telephone lines: VoiceSpan, which supports simultaneous voice and data transfer, and GlobeSpan, which lets telephone companies deliver T1 data links cheaply.

The company also makes high-speed modems and equipment that enables users to connect to wide-area data links. Paradyne recently left the low-end modem market.

In September, AT&T broke itself into three units: a long-distance services group, AT&T Global Information Solutions and an equipment group that covers phones, telephone company switches and transmission equipment and microelectronics products.

At least two analysts predicted a bleak future for Paradyne.

"We'll see vendors descend on the company like vultures and pick away at it," predicted Daniel Briere, president of TeleChoice, Inc., a Verona, N.J.-based consultancy. "It's going to get bloody, and the carcass that remains will be Paradyne employees."

"They never made the link with their network services unit work, which is a real shame."

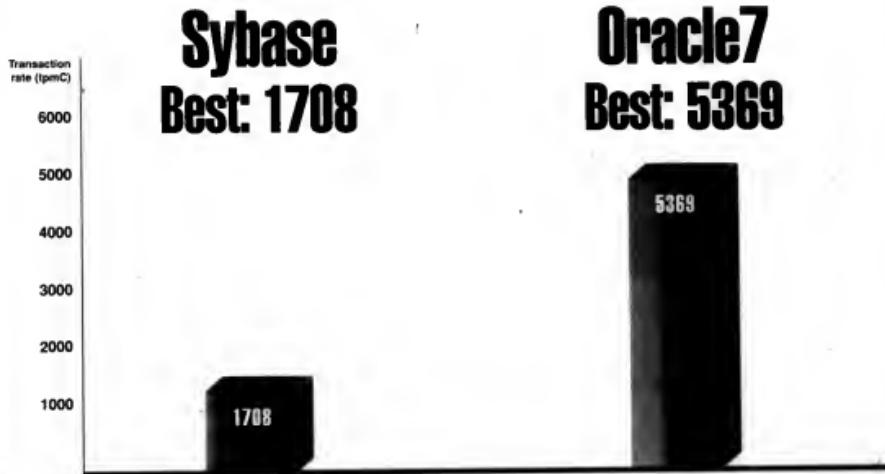
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Mark Hoffman, Sybase CEO, *San Francisco Chronicle*, April 5, 1995

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First Albany, *Information Week*, April 17, 1995

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# On-line wizardry

CONTINUED FROM COVER

ter at National Public Radio in Washington. With a bachelor's degree in audio engineering and English, Holt is a self-taught Unix aficionado who says a webmaster's most important skill is "the ability to combine left- and right-brained thinking." He's 25.

One thing is certain: webmasters are from all walks of corporate life and they are trending on UPS turf. Kendra Thersheer, webmaster at Upton Co.'s Greenstone Healthcare Solutions division, is a 56-something registered nurse. She volunteers as a webmaster on her own time.

"I have a friend who works for the company that helped design the site. They needed someone to take care of it, so here I am," Thersheer explained.

She likes teaching friends and colleagues about on-line life. "A lot of people here are only just starting to get on the Internet. We're pretty rural," she said, referring to her hometown of Coldwater, Mich., and its population of 15,000.

**Hidesstepping IS**  
Con-Way Transportation Services' webmaster is 41-year-old Gary Frazza, who is also the Menlo Park,

Calif.-based shipping company's director of corporate communications. Con-Way skirted IS altogether when its marketing department decided to launch a site.

"We knew our MIS people had some capability," Frazza said. "But we were more comfortable going with people who had some experience in this."

Yet who assumes a webmaster position depends on what a company wants to do with its Web site, experts said.

For users whose Web pages are basically static brochures, that salespeople would otherwise hand out, a webmaster without technical skills is OK, said Joe Balli, more senior network engineer for information services at Crancker Lane Old Country Store, Inc. in Lebanon, Tenn. But companies looking to conduct business or create complicated interactive locales on-line must involve IS, said Geoffrey Bock, an analyst at Patricia Seybold Group in Boston.

"What's key is being able to understand the flow of information through a site and the different systems that get it there," Bock said. That is a skill few marketers can provide, he said.

Finding a webmaster with a dense resume is easier said than

done. The demand "far outweighs the supply," said Alec Siegel, a senior associate at Halbrecht & Co., a Fairfax, Va.-based job placement firm that recruits Internet professionals for MCI Communications Corp., America Online, Inc. and other cyberspace outfits along the Beltway, or "Netplex."

Mutual fund firms, stock brokers and other Wall Street entities are scrapping faster than other industries to carve out electronic commerce niches, said Bill Adleita, president and chief executive officer at MarketVision Corp. in New York.

Surging demand for Web skills has allowed some cyberhome jockeys to command \$80,000 to \$110,000 or more in salary—plus stock options, sign-on bonuses and other perks—even with as little as three years' experience in the Internet trenches, according to recruiters and employers looking for Web workers.

"Prices for these people are all over the board right now. It's out of whack," said Ben Narasin, president of Internet Design Group, a

## WEBMASTERY 101

Experts say there are must-have skills for webmasters. Everything else is gravy.

### MUST-HAVE SKILLS

- A feel for aesthetics
- Knowledge of Unix
- Network administration know-how
- A sense of adventure

### NEED IT? YOU GOT IT! SKILLS

- IS experience in retail or sales applications
- Hypertext Markup Language acumen
- Experience in producing or designing a newsletter, technical documentation or other publication

### HANDYDAD FOR THE BIG BUCKS SKILLS

- Marketing experience
- At least one successful Web site project under your belt

New York Web consulting firm.

To find the type of experts its customers want, Halbrecht & Co. will sniff out staff working at its client's corporate rivals, Siegel said. "You don't run an advertisement to find these people—they are already employed," he added.

Such active recruiting makes it challenging for on-line pioneers to retain their talent. For example, Boston-based Fidelity Investments, Inc., which launched its Web site in February, tries to foster an entrepreneurial environment where the developers are treated like owners.

## The on-line eagle eye at UPS



**Josh Cohen**  
Webmaster, communications analyst  
United Parcel Service, Inc.  
Mahwah, N.J.  
<http://www.ups.com>

**Background:** Bachelor's degree in computer engineering from Lehigh University  
**Age:** 24

**Favorite on-line spots:** Internet Underground Music Archives at <http://www.iuma.com/gold/>; Cohen also maintains the Web site of Internet Relay Chat (IRC) at <http://www.early.com/ircd> and is involved in creating a new IRC protocol and various Web personal sites. "I've met two people that way. That's a sign of a true nerd, I know. Neither worked out in the long run, but it's a good experience."

**Most important webmaster skill:** No more than three years' experience at a given company. "You want someone as close to college age as you can get."

**Hobbies:** Electronic surfing and snow skiing

**Josh Cohen isn't the only webmaster at UPS, but he does a lot of the grunt work, such as sorting and answering electronic mail.**

Despite the fact that UPS's 24-hour, seven-day network operations center monitors the site, Cohen checks in to track traffic patterns and "make sure everything's running OK," he said. "I just like to know what's what."

Cohen estimates that he spends an average of nine hours per day at work. But that doesn't include the time he spends fussing over the company's Web server from his home PC or the times he gets paged on nights and weekends.

Now full-time network administrator, Cohen started at UPS as an intern in the information systems department in the summer of 1993.

UPS's original site, which offered little interactivity and is now defunct, was launched in September 1994. The current site, which took two and a half months to build, gets 15,000 to 20,000 hits per day. It was launched in May 1995.

The idea for UPS's external web site came from both IS and marketing, Cohen said, which made it a fun project to tackle. "We didn't have to deal with a lot of the red tape that comes with other technology projects because people just wanted [the site] up and going as soon as possible," he explained.

**Josh Cohen started at UPS as an IS intern in 1993 and today is a full-time network administrator. He often works on the company's servers from his home PC and drives in to watch traffic patterns. "I just like to know what's what," he says.**

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Fidelity's team of webmasters includes (left to right) Ralph Polz, Don Goebel, Cheryl Farmer, Dave Noyan and Tom Geron.

"They feel like parents, and you know parents don't want to leave their children," said Mary Ruth Moran, senior vice president of electronic marketing at Fidelity.

Indeed, Tom Geron, technical manager for Fidelity's electronic services, said he feels closer to the customer than if he were part of

the firm's central IS group.

"All our work — I mean all — is done toward serving customer needs," he said. "I like that."

The money and thrill of working with new technology may sound attractive, but longtime IS workers should look before they leap, several observers said.

## Wal-Mart's Web woman

**Jill Marie Sellers**  
Wal-Mart Stores, Inc.  
Bentonville, Ark.  
<http://www.wal-mart.com>

**Background:** Self-described "hardcore Unix proprietor head" and former fashion model.

**Age:** 27

**Favorite on-line spots:** None. "I absolutely do not" get on-line at home. **Most important webmaster skills:** Organization and deep knowledge of security technology.

**Hobbies:** Golf, as a stress reliever. "It's very simple compared to what I do on a day-to-day basis."

Sellers is part of a strong webmaster contingent: women.

In fact, the Web is drawing tech-savvy females in greater numbers than traditional IS sectors, several users and analysts told Computerworld.

"That's because, at least in part, you need to combine a lot of technical knowledge with the ability to cooperate with people who don't know a lot of technology," Sellers ex-

plained. Women "can often be very good at that."

Handling both Wal-Mart's internal and external Web projects, Sellers typically works so-hour days, starting at 7:30 a.m. However, she is quick to credit Web team members from all over Wal-Mart with making the retailer's on-line efforts a success thus far.

Sellers, a former runway model and owner of a graphic arts business, lives to shake up preconceived notions. "I'm trying to break the stereotype of a dumb blonde," she said. "When I talk to girls, people stand back."

Unit talk comes easy for Sellers, who has earned several technical certificates in the subject, although — like Microsoft Chairman Bill Gates — she does not hold a college degree.

She also knows network systems engineering and has a special place in her heart for TCP/IP. Previous work in marketing and graphic arts is "really, really handy," she said, adding that webmasters call for equal parts of visual acumen and technical know-how.

## Fidelity splits Web work

**Tom Geron**  
Technical manager for  
electronic services  
Fidelity Investments, Inc.  
Boston  
<http://www.fid-inv.com>

**Background:** Earned undergraduate degree in computer science from William and Mary College in Washington.

**Age:** 31

**Most important webmaster skills:** Layout and graphics experience, and general knowledge of distributed computing. "I wouldn't consider anyone who didn't have client/server experience ... but specific Internet experience isn't a necessity." **Hobbies:** Louisiana cooking and New Orleans-style jazz. "I used to play a lot of volleyball and soccer, but now I'm never home."

Fidelity, like other companies, doesn't have a full-time webmaster. Instead, duties

are distributed among several workers, inside and outside of information systems. Every link in the chain is equally important, according to Tom Geron.

Geron translates requests and concepts from marketing, sales, human resources and other departments into Web-readable and Web-accessible applications. It ain't easy.

"I can't imagine just one person being a so-called webmaster," Geron said. "That [idea is] a holdover from the early days of the Web when small experimental projects were going on." he said, referring to ancient times circa 1994.

Geron knows Hypertext Markup Language, the programming language of the Web. But he and co-manager Cheryl Farmer mainly oversee the design, construction and launch of on-line projects.

"My greatest fear is that Minsky will pick up something I did," he laughed, referring to a Web site called Minsky's Worst that regularly, and quite comically, berates poorly executed Web pages.

While most IS professionals' work is relatively insulated from public scrutiny, that isn't so on the Web. What you build can be seen globally by roughly 6.5 million users with direct access to the Web.

That realization can be an unwelcome job for some technical professionals who aren't used to

exhibiting their creations, said Jill Marie Sellers, a webmaster at Wal-Mart Stores, Inc. in Bentonville, Ark.

Indeed, working on the Web is like being naked in public.

"Your work is out there for all to judge," Sellers said. "And there are plenty of judges, too."

## Cybernauts at NASA

**Daniel McCoy**  
Software engineer at I-Net, Inc.;  
employed at NASA's Johnson  
Space Center in Houston since  
1990  
<http://shuttle.nasa.gov/sts-71/>

**Hobbies:** "That Web Guy"

**Background:** Earned bachelor's degree in computer science from the University of Houston. Project experience includes X Window System tools development.

**Favorite on-line spots:** "Any sites that are eye-catching and make use of innovative techniques." Also interested in downloading information about on-line development tools.

**Hobbies:** Gardening, camping and "anything that gets me outside and away from my computer." **Most achievements:** Began "fooling around" with Mosaic in early 1993. Became chief architect of NASA's Space Transportation System-71 Space Shuttle home page, which went live in June 1995. Has served as an Internet adviser to Johnson Space Center for the past two years.

One of the biggest Internet teams' that Computerworld has encountered works at NASA.

NASA's group of 150 Internet specialists, who include HTML programmers, graphic artists and workstation and networking gurus, are young to middle-aged. Roughly 70% are male, according to Kelly Humphries, the "team lead" for information services at NASA's public affairs division. Humphries' division administers the Space Shuttle home page.

Humphries, a nine-year NASA veteran and a former newspaper reporter, said NASA's aim is to present its home pages to the public as "informational tools."

NASA's McCoy is typical of other cyberspace at the space agency; all seek to deliver electronic information "as a service to better mankind," Humphries said.

NASA's Space Shuttle home pages include detailed information about each mission. Visitors can click on buttons to access countdown data, launch information and even download photographs from a video gallery.

## 'NET FACTS



Number of domain names registered each month

During the spring of 1995: 400

As of October 1994: 2,000

End of 1995: 20,000\*

Total that exists today: 110,000\*\*

\*Project

Source: National Science Foundation, Arlington, Va.

# Oracle's Larry Ellison on AT&T WorldMark Servers.

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*Larry Ellison, Chairman and CEO, Oracle*



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## Novel idea

A few weeks ago here, I lauded Novell's decision to refocus its efforts on its NetWare crown jewel after the company announced it was abandoning efforts to build a "super-network operating system" that would include Unix functionality.

There is mounting evidence that Novell must act even more aggressively to clearly delineate its enterprise strategy and shore up eroding confidence in NetWare.

Consider the information in our CW Guide, which begins on page 105. We polled corporate users about their overall satisfaction with their network operating systems.

NetWare, the clear market-share leader, finished last among the four network operating systems we included. NetWare was 30% behind the leader, which happened to be Microsoft's Windows NT, in overall satisfaction. NetWare got hammered in comparisons of overall performance, directory services and systems management. Of the five major categories of performance we measured, NetWare customers placed the product at the bottom in four of those categories and second from the bottom in the other one. And in our independent laboratory test comparing NT and NetWare, NT is a solid front-runner.

It is truly a good idea that Novell has moved away from the super-network operating system idea. But is that enough? I don't believe so. Dataquest recently produced numbers that show Microsoft has 90% of the market share in application suites. We ran a story last week about Novell's efforts to ship its PerfectOffice for Windows 95 suite sometime next year — late by several months. You can bet there's a frenetic effort at Novell to ship this product because Windows 95 sales are robust.

Is the application business, which was purchased from WordPerfect just before Novell Chairman Bob Frankenberg started his job, really worth the effort? Is that a battle Novell clearly has lost?

Paul Gillin, who regularly writes this editorial, wrote the week after Novell announced its intent to purchase WordPerfect that then-Chairman Ray Noorda should immediately pull the plug on the deal. I disagreed with Paul then, but he was right. It's too late for the company to get its money back. It's not too late to save NetWare.

*Bill Laberis*

Bill Laberis, Editor in Chief  
Internet: [bill\\_laberis@rcn.com](mailto:bill_laberis@rcn.com)

## Viewpoint

**BILL DISCOVERS THE DOWNSIDE OF VOLUNTEERING TO RE-ENGINEER HIS ORGANIZATION.**



### Salary survey came up a bit short

Computerworld's salary survey [CW, Sept. 4] is interesting as usual, but it is missing some important information.

Cost of living figures by region would tell readers much more. It's all well and fine that the western region's salary increase was 4.4% in 1984-85, but if our cost of living increased at a higher rate, we actually had a decrease in salaries.

The top of page 78 (Follow the Money) informed readers that the Midwest was the stingiest region for salary increases, but what we don't know is how much their cost of living increased. I suspect not nearly as much as other regions.

*Jim Wilson  
San Mateo, Calif.*

### Software program, by any other name

The publication of Daniel Paeck's letter chastising Joe Maglitta's use of the phrase "software programs" surprised me [Letters to the editor, CW, Sept. 25].

I have been in the "tub machine, computer, data processing, information processing and information technology" field since 1951. Instructions written for computers, whether applications or systems, were originally called computer programs.

When the word software was first used in the early 1960s, the phrases "software program" and "computer program" were used

interchangeably and have been since then.

*Joseph R. De Natale  
The Clipping Group  
Wellesley, Mass.  
[jdenatale@delphi.com](mailto:jdenatale@delphi.com)*

### Progress, but at what price?

In your editorial "Slow speed ahead" [CW, Aug. 21], you left out the most important reason most businesses "hold back the adoption of new technology." They don't need it, or they don't need it at the price of new hardware and retraining.

It's like to know, for instance, how much was spent acquiring multimedia technology because the information systems manager said the competition was buying it, and how much of a return such executive officers can calculate on the outlay.

*Richard H. Glancy  
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### On-line play time stunts productivity

"Ban on-line play at work? Don't!" [CW, Sept. 4]. Edward G. Prentice says that "positive motivation" will persuade people to use their time better, quit playing games and be more productive overall. However, a recent survey by Coleman & Associates, Inc. in Teaneck, N.J., found that 23% of PC

game-players said their most recent game-playing was at the office rather than at home.

Assume there are 40 million PCs in business and government, and each one is used to play games for half an hour a week. At a fully loaded cost of an employee hour of \$50 per hour, we are talking about a loss of \$1 billion a week, or \$50 billion a year. Is this where our trade deficit lies? This is what game-cost American productivity in one year. Can we afford to experiment with the "positive motivation" theory while we bleed money like this?

Many people say that if someone wants to goof off, he will do it anyway. I don't. When the opportunity arises itself, PC games will be used. Would you equip every employee's office with a poker table, golf practice tee, five arcade game boxes and the promise that no one will care if he/she plays during workhours?

Games at work are just another form of computer virus that attacks productivity. The computer industry learned to cope with viruses by learning them from computer disks. It will learn to cope with this more costly danger.

*Dana Hollander  
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**More letters, page 47**

**#** Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9175, 500 Old Connecticut Path, Framingham, Mass. 01702. Fax number: (508) 875-8573; Internet: [Internet@cw.com](mailto:Internet@cw.com). Please include an address and phone number for verification.

## Viewpoint

Brett D. Arquette

## Computer-room tours go downscale

**A**m I the only IS manager who can no longer define a mainframe server simply by looking at the size of the machine? It used to be easy, but things have changed — and they aren't done changing.

The industry persists in sticking labels on technology that changes faster than Superman in a telephone booth. When a company announces it will "upgrade to a downsized, mid-size computer in order to rightsize the organization," it leaves me with an oversize headache.

Most midsize computers are smaller but faster than the machine they're replacing. Is that really downscaling?

My shop recently unplugged a Digital VAX 6300 because we were pegging it and needed more power. In place of the big box, we bought a Digital Alpha 2100/4275 Server. This tiny little thing — smaller than a microwave oven — surely must be a server. It says "server" right on the cover, but it sure acts like a mainframe.

Even I know that mainframes are big, expensive, heavy industrial pieces of iron that can't be picked up by just a Cub Scout. It normally takes 2-35 Digital technicians to move a mainframe. My bosses freaked when they saw the little Alpha server. I believe the exact remark was, "I hope you know what you're doing."

After loading Digital's VMS Version 6.1 and, bringing on 700 users, I held my breath in hopes that this little box that says "server" on

it could function like a mainframe and handle the workload of a 400-user database and a 200-user office automation package. I was amazed when it used only one-third of its power at peak load.

How powerful does a server have to be before it's considered a mainframe? If I described a 64-bit machine that could hold 14G bytes of core memory and had 12 300-MHz processors, would you guess it was a mainframe or server?

Oracle and Digital recently announced a joint venture called the Very Large Database Concept, which ultimately means you could load your entire database into 14G bytes of core memory on the Digital 8400 Alpha Server (running VM/32 Version 6.3) and get unbelievable results.

Because all data calls are made directly from memory, the speed of this configuration is outrageous. Reports that take days to produce could be minute. The same machine also can be configured as a server. So what is this hardware monster? Mainframe or server?

I have found an area where size definitely counts: It's not very impressive anymore to give the old computer-room tour. Everything, including 40 disk drives, four controllers and tape drives, fits into a single, 19-in. rack that stands in the middle of an empty computer room that could be used for racquetball. It looks like a shrine for a solitary totem, ennobled in tile, white walls and glass. (It's also hard to justify one's salary when standing next to such an unimpressive rack.)

Never again will I hear the wonderful words, "Wow, you run all this?" Now the tour takes 10 seconds and consists of phrases such as, "There it is. Are you ready to go?"

In a few years, the already fine line between servers and mainframes will evaporate, and a new product buzzword will be invented. I can just hear it now, "Yeah, we just downgraded in order to upgrade to the new scr-fra."

Arquette is IS manager at the Ninth Judicial Circuit Court of Orange County, Fla.

## Is it a server or a mainframe?

The already fine line is starting to disappear.

Michael Schrage  
Revisiting *The Mythical Man-Month*

**T**wenty years ago, Paul Allen and Bill Gates shipped their first copies of Microsoft Basic and IBM software guru Fred Brooks published *The Mythical Man-Month*. Today, "Billionaire Bill" Gates is the richest man in America and Fred Brooks, chairman of the University of North Carolina computer science department and not quite a billionaire, has issued an updated anniversary edition of TM.

Who do you think has had a bigger — and better — influence on software quality?

In an ideal column, Gates would review *The Mythical Man-Month* and Brooks would offer insights into Michael Cusmano's and Richard Schantz's *Microsoft Secrets*, an exhaustive (if occasionally exhausting) analysis of Microsoft's software development practices.

What Gates has to say about Brooks' design and management philosophy — Brooks was, after all, the man responsible for the IBM 360 operating system — would be well worth noting. Similarly, Brooks' take on today's most successful software company should be of serious interest to Mr. Bill.

Intriguingly — sadly? — Brooks gets a

single mention in *Microsoft Secrets*. Then again, one of the book's sharper criticisms of Microsoft is that it has a tendency to reinvent wheels. To parallel process these books is to rediscover software's painful truth: Design is easy; managing development isn't.

Actually, these books are far less about software development than about managing people. Remember, Brooks' title mimics the bitter presentation of the "man-month" metric by pointing out that adding people to a failing project actually makes things worse. The IS management myth that programmers are interchangeable units in a software development is in truly destructive use. *The Mythical Man-Month* has much to say about effective management as anything written by Peter Drucker or Tom Peters.

To be sure, Brooks and Gates emphasize the importance of small, nimble teams, rapid prototyping and honest metrics. Microsoft's practice of daily builds, usability testing and pitting testers against coders has become part of the Redmond, Wash., company's development culture. The company's "sync and stabilize" ap-

proach, detailed in *Microsoft Secrets*, echoes the best practices articulated by Brooks two decades ago.

Yet it's crystal clear that Microsoft is running full bore into precisely the same management issues that Brooks so artfully identified a generation ago.

The most provocative — and disconcerting — message in these books is that Gates and Brooks place the highest priority on getting top-notch people. When Brooks was at IBM, the world's largest computer company had its pick of software talent. Today, Microsoft gets the very best programmers from MIT, Carnegie Mellon and the rest of the world. Yet, despite being able to get the world's top talent, Microsoft has management challenges that remain hardly peregrine. So what hope is there for the organizations left with the average talent?

The only rational conclusion is that management, metrics and methodologies will have to become even more important to the software development process than individual programmers. Optimizing the development system may prove more useful than optimizing the development individuals.

Schrage is a research associate at the MIT Media Lab. His Internet address is schrage@mit.edu.

Management, metrics and methodology will be the keys to software success.

Two books return to the point that software design is easy compared with managing development

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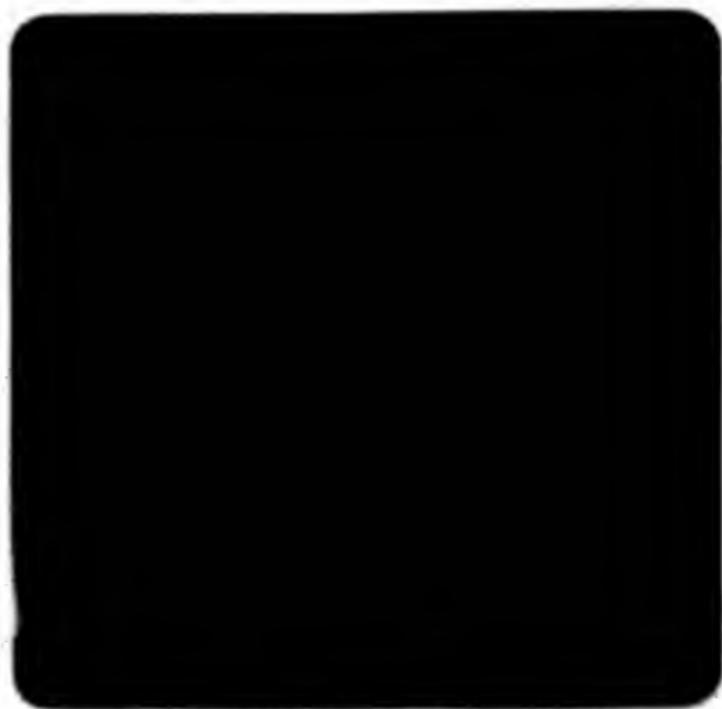
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## Viewpoint

### America Online not the only game in town

I found Gary Beach's criticism of America Online ("More service, less whining," CW, Aug. 14) unnecessarily mean-spirited. And Joe Warren's response ("Letters to the editor," CW, Sept. 18) was ridiculous, in particular his statement that if America Online changed its outage times to be less "East Coast-centric," someone would then complain that it had become too "West Coast-centric."

If you don't like America Online, why don't you make your suggestions for improvement to the people who can do something? Then leave the service if it doesn't improve to your satisfaction.

Come on, guys; don't forget you live in America. Competition generates superior services and goods. America Online isn't the only game, so why all the fuss?

*Tony Gurevits  
TbgmpG246@aol.com*

### Do Jobs and Wozniak know about this?

The shock of discovering in the "productivity/technology" timeline ("Premier 100," CW, Oct. 8) that Windows was announced in 1985, before the Macintosh was introduced, leaves me speechless!

To give Bill Gates credit for the graphical user interface is to buy into the Microsoft snow job a little more than necessary. I imagine Steve Jobs and Steve Wozniak are shaking their heads.

*John S. Williams  
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jsw2@home@aol.com*

### Apple paying the piper

How long is this Macintosh vs. Windows battle going to go on?" ("Letters to the editor," CW, Oct. 9) The letter writer is still trying to deal with this issue as if it were a technology beauty contest. If it were, we'd all be using Macintoshes or Next computers. Apple made a strategic blunder in 1989 and 1990 when it ignored pleas to license and open its technology and so grow the market. Consequently, Microsoft cleaned Apple's clock with a clearly inferior product. I suspect that before it is over, Apple will ascend to a lofty place among MBA case studies: "How to really screw up a good situation" might be a suitable title.

*Barry Walsh  
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### Usenet is no way to screen job applicants

In "Privacy fades for Web visitors," (CW, Sept. 25) Steve Madore, president of Deja News, talks about checking job applicants' Usenet posts to see if they post in "interesting or offensive" ways. He also says, "You cannot possibly be

concerned about privacy if you deliver a message to thousands of machines worldwide."

I most certainly can be concerned about privacy, especially if you're going to use a post to a newsgroup to evaluate whether or not I should get a job.

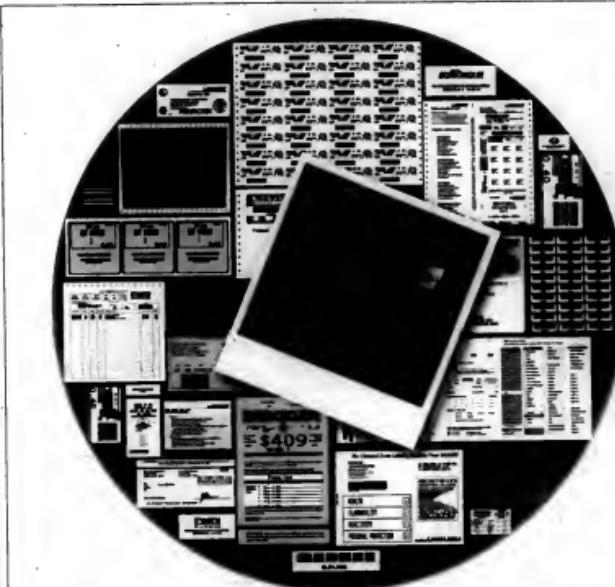
When I post to newsgroups on the Internet, I'm doing so in my leisure time, not as a professional.

Evaluating me based on Usenet posts

that aren't related to my business pursuits is like sitting next to me at a bar and, without my knowledge, using my conversation to determine whether I should be hired.

Just because you can search for posts doesn't mean you should search for them.

*Alan Tignani III  
North Ferndale, Pa.  
penguin900@aol.com*



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# Desktop Computing

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## Wall Street bullish on Mac

Despite Apple's neglect, the Mac is loved by some big guns in financial industry

By Lisa Peurifoy

**S**ome investment banking firms are putting Macintoshes where their money is.

A handful of large financial institutions, including Alex. Brown & Sons, Inc., J. P. Morgan, Montgomery Securities, Swiss Bank and the New York Stock Exchange, use Macintoshes as mission-critical parts of their business.

Macintoshes are being used several ways at these financial firms — as replacements for proprietary stock quote machines, primary systems on the trading floor and desktop systems for financial analysts and consultants.

Most users said they chose the Macintosh for its stability (display complex graphics, its networking capabilities, ease of use and the minimal support it requires).

Apple has traditionally focused on and is re-emphasizing its commitment to several key markets. Apple executives said these key markets include

desktop publishing, graphics, multimedia and education. The vendor has had several failed attempts to break into the business market, according to observers.

"I think Apple has neglected so much to this segment," said John Coulter, manager of business development at East Technologies, Inc., a Columbia, Md., developer that sells hardware and software to financial institutions. "The Mac offers so much in terms of ease of use and multitasking that it's natural for a clientele base that doesn't understand technology. Traders don't know computers, so the Mac OS is the best because it's got the quickest learning curve."

### Mac, Macs and more Macs

In some cases, the Macintosh exists with workstations that dominate Wall Street. But some firms are choosing Macintosh-only solutions.

Baltimore-based Alex. Brown & Sons, which runs one of the nation's largest trading floors outside New York, three years ago made the decision to update its technology and

went with the Macintosh.

"We couldn't hire anyone because the technology was so outdated that we couldn't find any more people to the system," said Bob Silbaugh, administrative manager of trading at Alex. Brown. The firm uses 90 Macintoshes and plans to roll out more to its offices in San Francisco, Boston and New York by the end of the year.

Before it decided to move to the Macintosh, the company used a variety of proprietary stock machines and quote computers. Name of the equipment was integrated.

"Some people had five and six keyboards on their desks," Silbaugh added.

Now Alex. Brown's traders can get information such as market data, stock quotes, news, charts, historical

data and databases — all viewed from a single screen on the Macintosh and accessed via a single keyboard, Silbaugh said.

John Pappo, president of The Carson Group, a capital markets intelligence firm in New York, also uses Macintoshes.

The firm has more than 100 Macintoshes, which are used to pull together a variety of stock information and market data to help the company analyze and identify who is buying and selling stock.

"The Macintosh gives the individual the information right on the desktop instead of walking over to a dedicated machine, doing a query and printing it out," Pappo said. Instead, analysts can do it all from one machine, and that makes them more efficient," he added.



## Zenith does notebooks

By Mindy Blodgett

Zenith Data Systems last week jumped into the high-end, multimedia, premium portable computer market with Z-Note GT.

The Buffalo Grove, Ill.-based Ze-

nith Data also introduced a mid-range notebook — Z-Note MX — that it hopes will jump-start its drive to become a player in the notebook field. Randi Giusto, an analyst at International Data Corp. in Framingham, Mass., said the portables,

which cost \$3,000 to \$5,000, are priced "fairly aggressively."

But Giusto said the market is crowded with multimedia offerings, and Zenith Data will have to work hard on the marketing to stand out. "At this point, that is what it all about," he said.

Ken Duniway, an analyst at Gartner Group, Inc. in Stamford, Conn., agreed that the multimedia notebook market has become increasingly competitive.

Z-Note GT has a 90-MHz Intel Corp. Pentium processor with an 11.3-in., high-resolution, active-matrix, thin film transistor screen and multimedia features such as CD-ROM. It has fast 25- or 40-MHz Pentium processors.

The Z-Note MX with a 7.5-MHz processor has a 10.4-in. screen with memory expandable from 8M to 40M bytes to support applications such as Microsoft Corp.'s Windows 95. It weighs 5.8 pounds.

## Microsoft to add telephony to NT

By Stewart J. Johnson

Microsoft Corp. will add telephone support to Windows NT next year, clearing the way for hardware and software developers to build client/server telephony systems based on NT.

The inclusion of the code to support computer/telephone integration (CTI) applications — called the Telephone Applications Program Interface, or TAPI — will come in the next release of NT sometime next year. That version will also give NT the Windows 95 user interface.

### Telephony tasks

CTI applications may be as mundane as enabling users to retrieve voice messages from their networked PCs or as complex as sophisticated telemarketing systems, said Hank Koerner, product marketing manager at Digital Systems, Inc. in Redmond, Wash. Digital Systems, which builds such systems, has also endorsed TAPI on NT.

Beta code for TAPI support on NT will be available Microsoft, page 49



Z-Note GT

Zenith Data's Z-Note GT and Z-Note MX portables include the following features:

#### Z-Note GT

- 11.3-in., high-resolution, active-matrix, thin film transistor screen and multimedia features such as CD-ROM.
- 64-bit mobile 25- or 40-MHz Pentium processors.

#### Z-Note MX

- 75-MHz Pentium processor and 80.4-in. screen.
- Room for two Type II or one Type III PC card.

## Desktop Computing

# FileMaker brings relational database to the desktop

By Cheryl Gerber

**R**elational database capabilities will land on end-user desktops when Claris Corp. ships the 32-bit version of its FileMaker Pro software this December.

On both the Macintosh or Microsoft Corp. Windows 95 platforms, FileMaker Pro 3.0 is receiving thumbs-up from beta testers. "This is 200% better than the previous flat-file version," said developer Peter Lock at AIPS Online, a subsidiary of America's Payment Systems Inc. in Los Angeles.

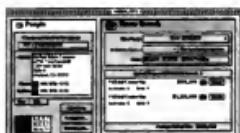
Lock has used the software on both platforms, although he said he prefers the Macintosh. He cited FileMaker 3.0's test rulers, indexing and import/export capabilities as improvements in what he regards as a re-engineered product.

### Big improvement

Compared with FileMaker Pro 2.1, Version 3.0 also works better with existing flat files, said Bob Cusick, director of technical services at Working Software Solutions in Sunny Valley, Calif.

Cusick said the most useful new features in the forthcoming version include the relational ability

to link disparate databases, conditional scripting and enhanced ScriptMaker. Users can also work both in flat-file or relational database mode, he said.



Claris' FileMaker Pro 3.0 allows users to work in flat-file or relational database mode.

A flat-file database can only look up and copy data, while a relational database can do a calculation or make a change in one database without automatically appearing in another.

Conditional scripting allows users to establish actions based on "if, then, else" conditions to check one piece of data or many pieces of data. Claris has also enhanced ScriptMaker, the format used to create templates, by adding previously manual functions and adding more menus

Both beta testers said the beta version is stable enough for the product to meet its December ship date. They also said converting FileMaker Pro 2.1 database files to

Version 3.0 relational files is an easy, menu-driven process.

### About the files

Users can retain their files in flat-file mode or create files that are related to other files. A new "Look-Up" feature, for example, allows users to point related data between files.

However, one beta user cautioned that the addition of relational capabilities will require users to know more.

If it's a flat-file database, a user can learn how to build a database progressively and intuitively. But if it's relational, you can just do it on the fly," said Ken Graham, a consultant at Technology Partners in New York. "You have to plan it in advance. Users are going to require more support for 3.0 than they did for the previous version."



### Wang's new image

Wang Laboratories, Inc.'s image viewer, code-named ImageVue, will be available by December as a free add-on to Microsoft Corp.'s Windows 95, according to the Billerica, Mass., firm. The software will provide users with a way to scan paper files, view and send faxes, annotate multipage image files and create image documents.

Industry observers said they expect the viewer to increase the visibility of imaging at the low end. For those who want more, Wang plans to offer an upgrade product, for an as yet undetermined price. This shrink-wrapped version will provide optical character recognition and other features to improve image presentation. —Tim Ouellette

# Microsoft adds telephony to NT gear

CONTINUED FROM PAGE 47

to developers this fall, said Charles Fitzgerald, a product manager at Microsoft's Personal Systems division.

Eighteen major vendors of telephone-switching and voice-processing equipment said they will build products that work with NT-based TAPI.

While support for TAPI on client systems is available for Windows for Workgroups and in Windows 95, several analysts said TAPI support on the server is the key to implementing complete systems.

Although many companies already have TAPI-based products based on Windows for Workgroups out today, this is still a nascent market. The addition of a TAPI-compliant server operating system that works with TAPI clients will likely help lock-start broader acceptance, according to several analysts.

Jim Burton, president of C-T Link, Inc., a telecommunications consultancy in Boston, said he sees Windows 95 as the "launching point" for integrating telephone equipment and computers. But he added that the real impetus for such a move will occur in about a year when server support on NT arrives.

This will enable users to choose Windows 95 or Windows NT to run client-side applications and Windows NT to run the server applications for CTL, said John

Dunkle, president of Workgroup Strategic Services, Inc., a consultancy in Portsmouth, N.H.

Microsoft's strategy to make NT available on all the major chap architectures also bodes well for TAPI, Dunkle said.

NT is "gathering considerable success vs. Unix, [so] we see it as a major platform for CTL," said Dave Coleman, senior manager for CTI at Northern Telecom in Santa Clara, Calif., which also has signed on to support TAPI.

### NT sales

#### International Data Corp.

estimated that

Microsoft will sell

nearly 400,000 new

units of Windows NT

Server this year and

nearly 500,000 new

units of NT Workstation.

Although many companies already have TAPI-based products based on Windows for Workgroups out today, this is still a nascent market. The addition of a TAPI-compliant server operating system that works with TAPI clients will likely help lock-start broader acceptance, according to several analysts.

Today, those functions are separate and are individually administered. "In the future, as TAPI integrates with network directory services, it will make things more manageable," Lewis said.

Today, those functions are separate and are individually administered. "In the future, as TAPI integrates with network directory services, it will make things more manageable," Lewis said.

### For users, it's decision time

**H**aving common programming interfaces on the client and server may prove to be a powerful inducement for developers and users when it comes to choosing between Microsoft's TAPI and Novell, Inc.'s competing standard, called Telephony Services API (TSAPI), observers said.

Neither standard offers both client and server sides right now. TSAPI focuses on the server side, and TAPI doesn't yet feature server support.

More than 40 server applications that use TSAPI already exist, while TAPI support on Microsoft's Windows NT Server is a year or more away, said Ron Culy, product line manager for telephony services at Novell in San Jose, Calif.

### Still competition

When TAPI or NT does arrive, that doesn't mean Microsoft will be the automatic winner either, Culy maintained. He cited Microsoft's lackluster success with its original OS/2 LAN Manager in the late 1980s as a case where users and developers chose Novell over Microsoft.

Still, "most [industry] players are looking at NT as a server platform," rather than using Novell's NetWare Loadable Modules, said Jim Burton, president of C-T Link. —Stuart J. Johnston

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# Got old, washed-up PCs? HP offers cold hard cash

By Mitch Wagner

**Looking to get rid of an ugly old festoon or your complete collection of Barry Manilow on 8-track tape?**

Then you're on your own.

But if you are an information systems manager looking to unload your company's obsolete PCs and workstations, Hewlett-Packard Co. hopes to offer a solution. HP plans in January to launch a program to buy any vendor's PCs and workstations from companies that no longer need them. HP will offer cash in return for the machines.

"If you're getting rid of 360 HP LaserJets and a few hundred PCs, we'll give you a price quote for what it's worth," said Craig White, general manager of the finance and remarketing division at HP's corporate consulting unit, Worldwide Customer Support Operations.

**Quotes of note**  
IS managers will be able to get price quotes by dialing in to a dedicated telephone line and using their Touch-Tone phone to punch in the number of units they want to sell and information on the makes and models. The HP appli-

cation will automatically generate a quote, White said.

There won't be any strings attached to the buyback program, but HP hopes the program will steer its salespeople into large corporate accounts. "We hope when companies replace that equipment, they'll do it with Hewlett-Packard equipment," White said.

#### Use it up

Duncan Wilcox, vice president of IS at Nicholas Applegate Capital Management in San Diego, said the HP buyback program could be a way for his company to gain cash benefits from old systems after they have been passed along from users who seek maximum power to less-demanding users.

"Typically, they work their way down the food chain. Right now, our standard configuration for an investment professional is a 100-MHz Pentium with 64 or 128M bytes of RAM. When the investors are done with it, it gets rolled down to operations and to an administrative level and so forth."

Wilcox explained.

Rose Taylor, general manager of planning and architecture at Chevron Information Technology in San Ramon, Calif., agreed. "As we bring in new equipment for our power users, we redeploy that equipment to people who don't need the latest and greatest, and then redeploy it again," she said.

Once HP has the old systems, the machines might be reconditioned or resold to companies that break them down for parts. Some companies even resell individual screws and melt down motherboards for their rare metal content, White said.

Allie Young, an analyst at Dataquest, Inc. in San Jose, Calif., said she expects the HP buyback program to be very successful. "I think there'll be a lot of demand," she said. "IS departments are being asked by users to be at the leading edge of technology, but what will they do with their old equipment? Suddenly, they've got closets full of old PCs that are fully depreciated, and they have to get rid of them."

## Nexgen woos, wins executive

Nexgen, Inc., a start-up maker of microprocessors, scored another personnel coup by hiring Keith Diersdorf, chief strategist behind the PowerPC chip architecture jointly developed by Motorola, Inc., Apple Computer, Inc. and IBM.

## Briefs

### Copiers connect directly

In what Xerox Corp. billed as a "major milestone," the company has introduced a line of digital copier/printers that will be directly connected to office computers. The devices will differ from traditional copiers in that they will receive documents directly from desktops and print them as ordered. The two products, the Document Centre 20, which will cost \$19,400, and the Document Centre 30, priced at \$36,600, will be cheaper and faster than the low-speed laser printers used in offices today; the vendor claimed.

### You oughta be in pictures

Compaq Computer Corp. and PictureTel Corp. have developed an entry-level desktop videoconferencing system designed for PCs running Microsoft Corp.'s Windows 95. The PictureTel Live PCS 200 add-on kit is based on the ITU-R standard, runs over Basic Rate Interface Integrated Services Digital Network lines and costs \$1,295.

### Microsoft buys stake

Microsoft has recently purchased an undisclosed minority stake in Individual, Inc., an electronic news service based in Burlington, Mass. The companies plan to create a user-customized news delivery service for The Microsoft Network (MSN) on-line service next year. In the meantime, Individual's existing iNews daily news bulletin will be available on MSN.

## If your corporate ladder has too many rungs, we've a shorter way to the top.

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## Desktop Computing

**Connectware, Inc.** has introduced AirPrint, a wireless printing adapter.

According to the Richardson, Texas, company, AirPrint lets PC users share up to eight printer resources without a network or the physical restraint of wires. It attaches directly to the parallel port of either a computer or printer and doesn't require cards or software drivers.

AirPrint is compatible with existing LANs and lets users place printers close to them rather than where the wires dictate. It has a range of 3,800 feet unobstructed or approximately 500 feet with wall, ceiling and floor obstructions.

An AirPrint adapter ret., which includes a connector, software and adapter, costs \$450.

► **Connectware**  
(214) 333-9060

**D. W. Witte and Associates, Inc.** has released Rumor, a software tool for economic evaluation and risk analysis of technology projects.

According to the Plano, Texas, company, Rumor lets users review and analyze multiple aspects of project completion, including probability, budgeting, benefit, risk and several intangibles, while planning technology projects.

Rumor guides users through functions, including pro forma cash flow (including planned, best and worst-case scenarios), net present value, internal rate of return, component risk, component life and life-cycle risk.

Pricing for Rumor starts at \$5,000 for a site license.

► **D. W. Witte and Associates**  
(214) 964-7682

**Thompson Network Software** has introduced The Doctor Anti-Virus for Microsoft Corp.'s Windows 95.

According to the Marietta, Ga., company, The Doctor Anti-Virus for Windows 95 provides on-demand, real-time signature scanning of disks and individual programs. It includes a Virtual Device Driver that automatically checks for viruses on floppy disks and programs before they can infect a system.

The product is written specifically for Windows 95 and supports long file name formats and 32-bit architecture.

The Doctor Anti-Virus for Windows 95 costs \$29.

► **Thompson Network Software**  
(404) 971-8900

**Polaroid Corp.** has introduced ProPakette 8000, a digital color film recorder.

According to the Cambridge, Mass., company, ProPakette 8000 produces 36mm, professional-quality positives and negatives at 8,000 lines of resolution for users who need photographic-quality output from the desktop. It creates 24-bit images with 36-bit/pixel precision in more than 16 million colors.

The ProPakette 8000 has an internal 7-in. CRT, autoexposure, color balance controls, custom optics and addressable

resolution. It was designed for professional laboratories, mini-laboratories and in-house service bureaus. It uses a parallel or SCSI interface with Macintosh or Windows-based PCs.

ProPakette 8000 costs \$13,995.

► **Polaroid**  
(617) 386-2000

**Inset Systems, Inc.** has unveiled HiJaak 95, a graphics application for Microsoft

Corp.'s Windows 95.

According to the Brookfield, Conn., company, HiJaak 95 lets users view a graphic image and convert, copy, print and update its features. The product supports 75 graphics formats along with Microsoft's OLE 2.0 and multitasking. It can convert any file, including word processing documents, spreadsheets and computer-aided design drawings, to any HiJaak-supported raster or meta file

graphics format with the HiJaak Print Capture printer driver.

HiJaak 95 creates thumbnail views of any image, using background processing. These color thumbnail images replace the generic operating system icons and are visible from the application's Explorer Network Neighborhood.

HiJaak 95 costs \$49.  
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# Workgroup Computing

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## Spalding Sports' imaging, workflow system on tap

By Tim Ouellette

**S**palding Sports Worldwide has stayed on the ball by using imaging and workflow software to improve its product development process.

After installing a Windows-based image retrieval system in its engineering department to cut down on product development time, the Chicopee, Mass., sports equipment maker decided to roll out the software to all its departments. The next step in the plan is to cut down on paper use and create automated workflows.

The imaging system has allowed product developers to create, dispense, comment on and update specifications on-line without being delayed by searching for paper copies of the specs and mailing them to offices worldwide.

### Improving the process

With the system, Spalding is handling twice as many specs and associated updates, while cutting development time from a year and a half to a matter of months, said Ed Purrot, a technical information systems consultant at Spalding.

More important, most employees have been willing to try the software because the imaging and workflow system wasn't installed to cut

costs and jobs but improve productivity, said Harry Brooks, head of operations research.

Imaging software transfers document images to a computer image file, while workflow software automates the movement of work items — which are often images — within a company. Spalding used software from Keyfile Corp. in Nashua, N.H., that runs on Windows desktops. It allows users to access image files stored in electronic file cabinets.

The goal of the system slowly evolved from being a departmental specification repository to reducing paper companywide to managing workflow, Brooks said.

"You can't do the workflow when you are locked down under tons of paper," Brooks said. After employees got used to working with the system to get their paper files on-line as image files, they started asking about redesigning various work processes throughout the company, he added.

For example, employees helped redesign a process that helps generate an internal code number required to ship goods from the factory.

Previously, Brooks said, it took a lot of scrambling within various departments to get the information for the code, causing delays in product shipping. Now, a commodity code workflow



**Spalding Sports' Harry Brooks** image after using an image management system to cut down on product development time, the company is now looking to reduce paper use and automate work processes companywide

is started the same time a new product spec is created, and the code is ready when the product is set to hit the streets.

Deciding how other processes should be automated has employees with similar functions jockeying for different degrees of participation in the process. "The technical difficulties

Spalding, page 62

## Sun gives high-end Unix servers a boost

By Jean S. Bozman

Sun Microsystems, Inc. is boosting the waitlist on its high-end Unix servers this month, adding faster chips and allowing onboard processors to grab more memory as they need it. Systems performance for the servers will improve up to 40%, the company said.

Sun's latest batch of Unix servers run on 60-MHz SuperSPARC RISC chips under a Solaris 2.4 Unix operating system. The units will replace servers based on 60-MHz RISC chips that have lagged in performance for several years compared with rival RISC chips, analysts said.

Although Sun's workstation users had been able to upgrade their 60-MHz chips by swapping in faster hyperSPARC chips from Ross Technologies, Inc., in Austin, Texas, the Ross chips didn't work with Sun servers, Sun said.

### Upgrades needed

Users said the processor upgrades — priced at \$5,000 per CPU for older SPARCserver 1000E machines and \$8,000 per CPU for SPARCenter 2000E machines — are welcome improve-

ments. "It sounds like a good option for us," said one West Coast user who asked not to be identified.

Base prices for the SPARCserver 1000E units are \$50,100 to \$181,090; the SPARCenter 2000E range from \$125,390 to \$675,596. The servers are set to ship this month. Sun cut prices on its 1000E servers up to 25% this summer.

The servers provide more paths between cache memory and main memory. This is designed to boost database performance. But several users said their main upgrade needs involve disk I/O speeds for their 1000E servers accessing databases rather than more processor

capacity.

Some users plan to use the new hardware right away. "We're expecting a significant performance improvement," said Geoff Riddell, decision-support systems manager at BC Telecom, Inc. in Vancouver, Canada, who has ordered a 14-processor SPARCenter 2000E.

### Moving ahead

BC Telecom developed a data warehouse using a smaller SPARCenter 1000 with eight processors and Oracle Corp. 7.x databases. After learning of the faster processors several weeks ago, the site was able to rewrite its lease to include

new chips for the 14-CPU production machine. Riddell said that with installation due this month, "our timing was good."

Others plan to wait. "If you're not running at or near capacity, there may not be a need to move right away," said Roger Holtom, business technology consultant at Ciba-Geigy Corp.'s Chemicals Division in Greensboro, N.C. "If we would do anything at all for disk I/O, then we would upgrade. But our CPU usually run at 30% to 50% of capacity," he said. His site has four SPARCenter 1000Es running Oracle databases and SAP America, Inc. R/3 manufacturing applications.

The enhanced SPARCenter 1000E and SPARCenter 2000E servers most likely won't be upgradable to Sun's next-generation processors, the 64-bit UltraSPARC chips, several industry analysts said. UltraSPARC-based servers will have faster system buses and use different cache memory, analysts said.

"They're definitely nearing the end of their life, and there are clearly going to be questions from users about how to upgrade to UltraSPARC servers," said Tony Iannas, a research analyst at D. H. Brown Associates, Inc., in Port Chester, N.Y. He said many users are realizing that their next high-end Sun server upgrade may involve buying a whole new system.

OCTOBER 23, 1995 COMPUTERWORLD

Sun's new high-end servers					
Model	Processors	RAM	Main Memory	Storage Memory	Price Availability
SPARCserver 1000E	3 to 8 8x-400 SuperSPARC II RISC chips	3 to 12 8x-slots	Up to 2G bytes	Up to 768G bytes	\$50,100 to \$181,090 \$125,390 to \$675,596
SPARCcenter 2000E	2 to 16 8x-400 SuperSPARC II RISC chips	4 to 40 8x-slots	Up to 5G bytes	Up to 4,096 bytes	\$125,390 to \$675,596 \$125,390 to \$675,596

**A**fter a decade of breaking down functional barriers in companies, why do we continue to keep structured and unstructured information apart? Relational databases are stuffed with structured information that is hard for non-technical business professionals, such as salespeople and managers, to access and use. Yet, unstructured information stored in e-mail messages, faxes, spreadsheets and word processing documents is an equally valuable source of corporate knowledge.

As demand for more strategic use of information grows, IT departments must respond with new business applications that unify structured and unstructured information and make it available for day-to-day business use.

Until now, the challenge has been how to leverage information in relational database management systems (RDBMSes) for a wide range of client/server applications. Recently, the rules have changed again. Today's critical applications must meet even tougher requirements: sophisticated workflow processing, enterprise-wide connectivity to customers and suppliers, and support of increasingly mobile users. The sticking point is that transaction-oriented applications are frequently difficult to enhance and modify, and are not architecturally designed to support these new application requirements.

Groupware has emerged as a technology that complements the strengths of RDBMSes. Most people know that groupware is designed to manage and distribute documents anywhere in the enterprise, but far fewer are aware that groupware can give users access to both structured and semi-structured information, regardless of location or computing platform.

To integrate effectively with RDBMSes, a groupware product must:

- Offer a variety of straightforward database connectivity options

- Provide robust support of distributed workgroups and mobile users
- Enable workflow automation to move information through a business process

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Notes™ supports access to the leading RDBMSes. And because Notes runs on all popular computing platforms and supports the leading APIs, you can quickly build applications to distribute and update

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Now applications can pull human resource information from transaction systems into Notes-based applications that automate the entire hiring process, from searching for candidates with specific experience to making job offers.

Companies can more effectively win competitive bids by quickly generating accurate and complete proposals integrating the latest cost information from transaction systems with the rich document authoring capabilities of Notes.

In hundreds of sales organizations, Notes fosters "virtual" team selling by coordinating the latest information gathered from such disparate sources as call reports, real-time news feeds and financial transaction data. Salespeople can continuously and securely update colleagues anywhere in the world with the latest customer or competitive information.

Field-based work crews can be managed more effectively when work order transactions are distributed via Notes. As jobs are completed, crews replicate updated information back to headquarters.

The technology may be sophisticated, but the point is simple: anywhere structured and unstructured information must come together to create business value and support critical decisions, there's only one groupware product that combines the ability to communicate, collaborate and coordinate with efficient, reliable RDBMS integration. **Lotus Notes.**

**Lotus**  
Working Together®

# Stratus Computer turns on Radio, a fault-tolerant server

By Michael Goldberg

**Stratus Computer, Inc.'s new PC server offers PC LAN users fault-tolerant options in a neat package. But the Radio server — a departure from its history of providing high-end, fail-safe computers for transaction processing — also prompts questions about Stratus' ability to generate any momentum in an already teeming field.**

Unveiled last week, the Stratus Radio server is billed as "a PC cluster in a box." It uses commodity components such as Intel Corp. Pentium processors in a cabinet with eight nodes for networking, computing and disk storage. [CW, July 17].

Radio, which stands for Reli-

able Architecture for Distribut- able I/O, will run on Microsoft Corp.'s Windows NT operating system and SCO, Inc.'s UnixWare, which SCO recently bought from Novell, Inc. Stratus officials said users can attach up to four RAID boxes together into one cluster.

## Bringing it together

Radio incorporates software from Ixia Distributed Systems Inc., a Stratus subsidiary, to detect hardware and software failures in the system and users' applications. The software can direct recovery and restart applications on another node in the system while notifying users of a system flaw if a user selects those options.

## Fault tolerance

Stratus is selling Radio directly and through resellers.

Users and analysts praised Stratus' design, especially its use of PC-familiar ingredients and a dedicated pair of network connections, which provide a backup connection for compute and storage nodes.

At the same time, observers said Stratus is entering an unfamiliar field dominated by software vendors such as Compaq Computer Corp. and Hewlett-Packard Co. Stratus is in Marlboro, Mass., is likely to have an uphill fight in winning customers outside of its traditional base, said Jon Oelick, an analyst at Forrester Research, Inc. in Cambridge, Mass. "They're really not an unknown player."

But for Stratus users moving to more PC-based applications,

Radio comes as exciting news. At New York-based brokerage house PaineWebber, Inc., Danny

**A brief, bold**  
Radio, Stratus' new eight-node PC/LAN server, offers three levels of fault tolerance.

**Computer systems:**  
Two, three or four, each with dual 133-MHz Pentium processors

**Network switches:**  
Two, three or four, each with two 10-Mbit Ethernet ports and six 100-Mbit fiber-optic ports

**Interconnect switches:**  
Two, each with model-B Ethernet hub or switch

**Operating system requirements:**  
SCO's UnixWare, Microsoft's Windows NT Server available next month

**Price range:**  
\$63,000 to \$150,000

Gumpert, senior vice president and director of distributed systems management, said he plans to install Windows NT-based Radio servers in some of his firm's 250 branch offices. Many of PaineWebber's 13,000 PC users are pushing the limits of Windows 3.1, and Radio with NT would give them a fault-tolerant application server with a familiar feel, Gumpert said.

Initially concerned about support for Radio, Gumpert said he was relieved when Stratus offered its traditional method of monitoring customers' systems and alerting them of failures.

Larry Friedman, vice president of financial services at Price Chopper, Inc. in Schenectady, N.Y., said his supermarket chain will use a cluster of Unix-based Radios to develop marketing and decision-support applications from data it collects from customer transactions. "The big thing with Radio is that it's a way to do [fault-tolerance] cost-effectively with standard PCs and software," he said.

# Firm introduces router to link remote offices

By Laura D'Addio

**Compatible Systems, Inc. in Boulder, Colo., recently introduced a low-cost, wide-area router that lets small and medium-size businesses consolidate remote-office traffic into corporate headquarters.**

The new RISC Router 3600R lets businesses link up to 12 remote offices to the central office at speeds up to 256K bit/sec. The RISC Router 3600R is a flexible device that lets businesses consolidate their wide-area network (WAN) traffic and mix and match routing connections that work best for individual offices.

## Wide-area links

Users such as David Yacovych and Jerry Hamanond, programmers and systems analysts at Mendocino County Schools in Ukiah, Calif., said they are interested in the RISC Router 3600R. It will allow them to create WAN links among the county's 15 district offices and eventually the 50 schools in the district using standard voice, leased and switched 56K bit/sec. or integrated Services Digital Network lines.

Hamanond said Mendocino County currently has Compatible Systems' 3400R RISC Router and is pleased with the device's reliability and ease of use.

"We especially like the fact that the routers are software configurable from within Windows, so it's much simpler and less time-consuming to configure

## Vital statistics

**Company: Compatible Systems, Inc.**  
**Product:** RISC Router 3600R  
**Features:** Consolidates remote-office LAN traffic at the central office  
**Price:** \$3,495  
**Shipping:** Now

than many other routers," Hammond said.

Additionally, the RISC Router 3600R routes all industry-standard networking protocols, including TCP/IP, Novell, Inc.'s IPX, Apple Computer, Inc.'s AppleTalk and Digital Equipment Corp.'s DECnet.

All of the parts are independently configurable and support both synchronous and asynchronous data transmission using either Point-to-Point Protocol or frame-relay, wide-area transport protocols, according to Tom Ferraro, product manager at Compatible Systems.

Eric Hindin, a senior network analyst at The Yankee Group, a Boston-based consultancy, said Compatible Systems gives users a "wide variety of connectivity options, depending on the needs of their various remote office."

Compatible Systems has "also priced its route line very aggressively, and they provide users with free software upgrades, which is another big cost savings," Hindin added.

The RISC Router 3600R is available now.

# Legato unveils NT version of NetWorker backup software

By Steve Moore

Developers are beginning to provide centralized ways to handle critical systems management functions across mixed Unix/NT networks. Legato Systems, Inc. in Palo Alto, Calif., for example, recently introduced a Microsoft Corp. Windows NT version of its NetWorker multipurpose backup application.

Analysts hailed Legato's NetWorker for NT. "It allows you to sit on NT and back up Unix or sit on Unix and back up NT," said Mike Peterson, president of Strategic Research Corp. in Santa Barbara, Calif. Other available products let users back up NT clients from Unix servers, but vice versa, he said.

## Spice of variety

Also appearing, users said, is the product's support of a broad range of client/server platforms, including NT, OS/2, Macintosh and most Unix variants.

At the Department of Natural Resources for the Canadian Forest Service's Pacific and Yukon region, NetWorker is used to back up NGT along with Unix machines from Silene Graphics, Inc., Sun Microsystems, Inc. and Digital Equipment Corp.

"We haven't seen anyone demonstrate this much cross-platform [backup] support, even across all Unix platforms," said Guy Gondor, chief of informatics at the Canadian government research agency. "NetWorker is supporting [Digital's] Pathworks Version 6.0, which was just announced but is not available to us yet," he said. "The only thing they don't do well is the technical documentation," which isn't well organized and lacks enough detail, he added.

Centralized backup such as that provided by NetWorker "is very cost-effective" when used to support "a reasonably large group of people," said Jim Levi, a systems analyst at Eastman Kodak Co. in Rochester, N.Y.

Kodak must back up 60 mixed Unix workstations as well as more than twice that many Windows 3.1 and Macintosh machines, he said.

Legato's Macintosh support will be valuable for the University of California's San Francisco facilities, where 2,000 Macintoshes are used along with Unix, NT and Novell, Inc. NetWare servers, said Joseph Silverton, a systems analyst at the school. With Legato's centralized backup software and Macintosh support, "we don't have to buy dedicated Mac or tape drives," he said.



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**TECHNOLOGY**

## Workgroup Computing

# Percussion offers 'Live' performance for Notes

By Tim Ouellette

Percussion Software made a lot of noise recently with its introduction of Notes Composer Live.

The Notes-compatible software promises real-time access to relational database information from a Notes client.

This feature promises to leapfrog Lotus Development Corp.'s NotesPump, announced earlier this month. NotesPump and similar products copy information from relational databases down to Notes databases, then attempt to resynchronize the data when they return it to relational databases.

"You might get data that might be out of date with replication," said Glenda Smith Morgan, a senior computer analyst at Day & Zimmerman Information Solutions, Inc. in Radnor, Pa. "When a customer calls for account information, you want up-to-date information from the database."

Notes Composer Live runs on Microsoft Corp.'s Windows NT or OS/2 servers. Users fill out a Notes form to link Notes to the database and retrieve the designated fields in Notes.

### Data integration

Morgan added that with Notes on every desktop at Day & Zimmerman, it helps to have direct access to relational database information from one front end. The company currently uses Percussion's Notes Composer, which works much like NotesPump does.

There are two problems with database replication, said Andrew Augin, vice president of marketing at Stoneham, Mass.-based Percussion. Data brought into Notes may change when it is copied back to the relational database, and often, Notes databases become full of information that doesn't need to be there.

"You don't have to duplicate your relational database into the Notes database," Morgan said. "You might only keep current things in the Notes database if you wanted immediate access."

Notes Composer Live costs \$7,500 and comes with Object Database Connectivity, file-flat interfaces and a Notes-to-Notes transfer utility. Direct database drives for IBM's DB2, Oracle Corp.'s Oracle7 and Microsoft's SQL Server, Inc.'s SQL Server cost \$3,750 each.

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## Spalding

CONTINUED FROM PAGE 57

tive are minimal. It is the political issues you have to deal with," Brooks said.

While Keyfile is well known in the industry, it isn't such a major player that it could afford to buy a high-end, high-volume imaging system that requires lots of integration and training. That is why it went with the lower-cost, easy-to-install Keyfile system, Brooks said.

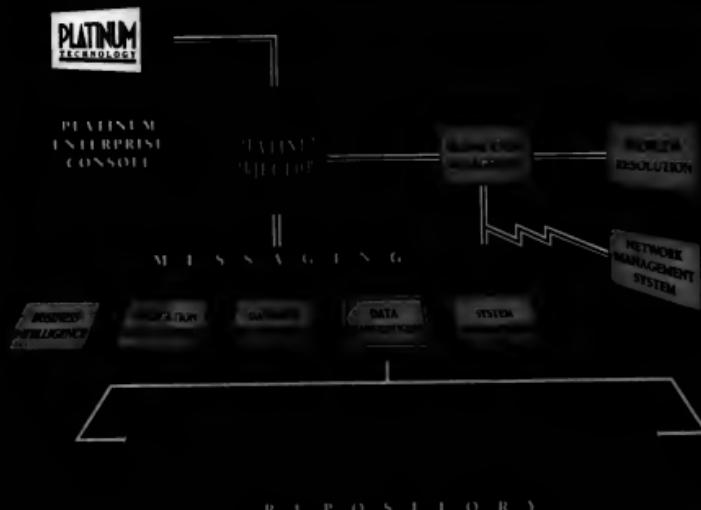
Parrot said it takes him about 45 minutes to familiarize users with the software and how to use the system to view spectra.

### Making it work

It can be a challenge to get users to integrate Keyfile into their normal work routine. But IS gets help from the specifications office, which used to print, copy and mail out each new change. Brooks said the office will let employees ask for a copy of a spec only once. After that, employees must retrieve all previous specs from the Keyfile system.

There are currently 180 users of the Keyfile system and some walk-up terminals for factory workers. During the next year, about 250 more employees will be linked to the system, Brooks said.

Product specs reside on a Keyfile OS/2 server, while a Unix server handles other imaging needs and workflow at the firm. Users need to log on separately to each server, but Spalding plans to install the next version of Keyfile, which promises to integrate the Unix and OS/2 servers.



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**InfoSession**, a quick, non-invasive middleware solution that links mainframe-based data to PC-based applications.

**InfoPump** and **InfoHub** allow access, refinement, replication, and loading of records by PC users in a heterogeneous, multi-tiered client/server environment.

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## Workgroup Computing

**Voss, Inc.** has introduced the Armada Cruiser 100 System, a desktop videoconferencing system.

According to the Dallas company, the Armada Cruiser 100 System provides video at rates up to 24 frames/sec, over Basic Rate Interface Integrated Services

Digital Network lines. It was designed for applications requiring one- or two-way full-motion video with audio.

The product includes a Peripheral Component Interconnect-based hardware board, a camera, an audio handset and user software. It can support data rates from 64K to 384K bits/sec. Features include file transfer, electronic whiteboarding and real-time application sharing. The product is also standard-compli-

ant and fully interoperable with any H.320 desktop or room system.

Pricing for the Armada Cruiser 100 System starts at \$1,595.

► **From**  
(214) 774-3890

**Emulex Corp.** has introduced Net Wizard Printer Server Administrator.

According to the Costa Mesa, Calif., company, Net Wizard Printer Server

Administrator gives network managers a means to control Emulex NetJet and NetQue multiprotocol printer servers. It provides access to management functions through a Windows-based graphical user interface and manages the printer servers through Simple Network Management Protocol over TCP/IP or IPX lines. The product was designed to simplify the configuration procedures for printer servers and printers.

Net Wizard Printer Server Administrator starts at \$25.

► **From**  
(714) 662-5890

**Pitney Bowes, Inc.** has introduced the Model 9610 multifunctional workgroup fax/prINTER.

According to the Stratford, Conn., company, the Model 9610 is a plain-paper fax unit that connects to a PC to print laser documents at 8 pages/min. It can also scan documents and include logos and graphics.

The product complies with Energy Star standards and saves energy by resting between transmissions.

The Model 9610 fax/prINTER costs \$9,995. It can be rented for \$130 per month.

► **Pitney Bowes**  
(203) 361-7000

**Keyfile Corp.** has announced Keyfile Document Server, a document management and workflow product for Microsoft Corp.'s Windows NT.

According to the Nashua, N.H., company, Keyfile software lets users electronically handle every office document — both paper and electronic — by providing a tool for filing, retrieving, sharing, distributing and automating document management. It uses object-oriented technology and a drag-and-drop graphical workflow interface.

Licence pricing for Keyfile Document Server starts at \$7,995. Client software is priced separately and starts at \$795.

► **Keyfile**  
(603) 883-3800

**Speco Technologies Corp.** has introduced VisionTime Pro, a videoconferencing product.

According to the Santa Clara, Calif., company, VisionTime Pro is a Windows-based whiteboard application that lets two users exchange video, graphics and text data. Video graphics image data can be captured or loaded from a disk and placed on the sending whiteboard and then viewed on the receiving whiteboard. VisionTime Pro requires a modem-equipped PC to support document conferencing over regular telephone lines, digital telephone lines, networks and the Internet.

Pricing for VisionTime Pro starts at \$495.

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\*Based upon 1989 user configuration.

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# Enterprise Networking

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## ARIES shoots for the stars

Project to transmit live data from ship to satellite to ATM network

By Neal Weinberg

**W**ith two successful demonstrations under their belts, members of the ARIES project — the Broadband Asynchronous Transfer Mode (ATM) test bed — are planning a live transmission from a ship at sea in February.

In a brief demonstration last month in Cleveland and a longer one two weeks ago in Houston, simulated seismic data was sent at 155Mb/sec. from a ground station to a satellite and back to a ground-based ATM network.

The success of those efforts has buoyed members of the ARIES team — a collaboration that includes NASA, the American Petroleum Institute, several oil companies, ATM equipment vendors, local and long-distance carriers and academic institutions. ARIES stands for ATM Research and Industrial Enterprise Study.

The demonstrations prove that ATM is possible for these types of real-time collaborations, according to Larry Flournoy, Texas A&M University's ARIES representative.

### New a reality

David Beering, the project director and a staff telecommunications analyst at Amoco Corp. in Chicago, said that 15 months ago ARIES was nothing more than a concept. Today, there is a network up and running. "We're moving at March 1," he said.

ARIES team members plan to transmit live seismic data from a ship in the Gulf of Mexico to NASA's satellite and then to the land-based ATM network, where scientists will analyze data from the ocean floor.

For oil companies, this could mean a huge advance in oil exploration. Currently, specially equipped ships gather data on magnetic tape, which is then carted ashore and analyzed over several months.

"This is a beautiful opportunity for information technology to change an industry," Beering said.

Participants said the project is simply too massive for any one company to undertake.

With NASA's Advanced Com-



munications Technology Satellite, the ATM switches and other hardware provided by vendors and the academic supercomputers used to crunch the data, the network contains an estimated \$1 billion worth of equipment.

"Collaboration is the key,"

Flournoy said.

Despite the huge costs involved, Flournoy said the major

hurdle to overcome is "people mentality," such as getting competing vendors to work together.

The ARIES project is already drawing interest from outside the oil industry. Flournoy said Texas Medical Center, a teaching hospital in Houston, plans to do a demonstration next month that will send X rays from Houston to a medical convention in Chicago with ATM.

Flournoy pointed out that X rays sent from the hospital to a remote site currently take an entire night to download.

From the carrier point of view, ARIES is a learning experience and an exercise in cooperation among competing companies, said Daniel Briere, ATM market manager at Sprint Corp. in Kansas City, Kan.



## Voice over ATM faces several key obstacles

By Bob Wallace

Although adding voice traffic to the blend of data and video would help users more easily justify Asynchronous Transfer Mode (ATM) services, it will be years until voice over ATM lures users away from existing and interim solutions.

That gloomy forecast is built on a solid technological and financial foundation. There are no standards for voice over ATM, extra equipment will be needed, and public ATM services require very high-speed access lines.

### Wait and see

Today, only the largest corporations can justify the cost of ATM, and that is because they have super high-end applications that eat up bandwidth. Adding voice traffic to the mix would make ATM available to a broader user base.

But users shouldn't hold their breath: "It could be a few years before users run voice over ATM networks," said Daniel Briere, president of TelephoneChoice, Inc., a Verona, N.J., consultancy that tracks telephone company networks. "There are too many obstacles, such as service availability and cost, not to mention cheaper proven alternatives."

In the meantime, most users need voice over virtual voice network services, such as AT&T Corp.'s Software-Defined Network (SDN) service. The service has been carrying voice calls for less than 10 cents a minute for years. Users need only an access connection.

### Cheap and easy

- AT&T's SDN and competing offerings were designed in the late 1980s to lure users away from private voice networks to the telephone companies' public networks, which are inexpensive and don't require users to act as telephone companies.
- **Obstacles to running voice over ATM networks**
- **Need extra bandwidth and greater access lines.**
- **Lack of equipment to pass voice from telephone systems to ATM switches**
- **Interoperability problems**
- **Carriers focus on data and video over ATM**
- **Access lines must support multiple protocols simultaneously**
- **No standards available**

But some users are still looking to go one better.

"We've got a 750-site SDN, and we're still taking a serious look at voice over frame relay," said Dan Gones, telecommunications manager at Domino's Pizza in Ann Arbor, Mich.

Gones said he will "take a look at running voice over ATM when ATM becomes a reality, which could be a few years."

But users and analysts see voice over frame relay as an interim solution to voice over ATM for medium to low voice traffic.

Today, users need large access pipes to tap in to a public ATM service. They could defray the cost of the connection by using it to share multiple voice and data services simultaneously. All major national carriers should support 1.544Mb bit/sec. access by the end of the year.

OCTOBER 23, 1995 COMPUTERWORLD

### The Microsoft Network



**PROS:**  
Easy-to-use interface  
Tight integration with Windows 95  
Seamless OLE drag-and-drop operations across applications

**CONS:**  
Limited content  
Heavily advertiser-oriented  
Sluggish, with access speed of 14.4K bit/sec.  
Currently single-user

## The Microsoft Network not yet a contender

By Howard Milstein

The Microsoft Network (MSN) does some spiffy things with graphics and has the basic foundation of what it needs to succeed in the market. But right now, it's more of a billboard than a bulletin board.

### Review

MSN's main drawback is its lack of content. And in on-line services, content rules. At the moment, MSN's offerings are overshadowed by the encyclopedic offerings found on America Online and CompuServe. While most content targets

MSN, page 74

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# Telnet users warned of hazards

If public access isn't secure, users could break into restricted areas

By Gary H. Antnes

**L**ibraries and other institutions that throw open their digital doors to the public run the risk of letting in troublemakers, according to security experts.

The Computer Incident Advisory Capability (CIAC) team at Lawrence Livermore National Laboratory in Livermore, Calif., recently issued an advisory warning about using Telnet to give library patrons Internet access in card catalogs and other library databases.

If the version of Telnet offered to the public isn't carefully stripped of unneeded features, it may offer a path for users to surreptitiously move into private sys-

Do's and don'ts	
<b>Some things to be aware of when giving public access to your systems via Telnet or the World Wide Web:</b>	
Keep it simple and give users the minimum capabilities necessary.	Put your server between your firewall and internal network.
Use a Telnet client modified to block users from entering the command prompt.	Put any confidential information on your service.
Install all operating system and Web server patches supplied by vendors.	Use a "fully functional" Telnet client.
Run your server in restricted file space and set it up in "unprivileged" mode.	Use the "include files" feature.

Source: Information International, Falls Church, Va., and Lawrence Livermore National Laboratory, Livermore, Calif.

tems at the library or other libraries linked together, the CIAC said.

Corporations allowing entry into their systems via Telnet or World Wide Web

browsers are also exposed, experts said.

Libraries try to set up public Telnet access in a way that limits outside access to a few services, said Marvin Christensen, a computer scientist at the CIAC team. "The vulnerability is that if the system administrator doesn't set up the connections correctly, the person coming in from the public can get out [of the restricted area] and do unrestricted services," he said.

The problem is caused by the nature of libraries: They exist to make information easily available to the public but must carefully guard other data.

**Companies have problems, too**  
Corporations trying to guard access to data face similar issues.

Unless the corporate Web server is carefully set up with all appropriate security features in place, users could break out of the public space on the server to retrieve password files, install password or credit-card "sniffers" or jump to other systems, said John Presatore, an information security analyst at Information International in Falls Church, Va.

"Libraries have long had concerns about the privacy of their circulation records," said Susan Antnes, associate director for public services at the University of Colorado in Boulder. "They have even stopped the FBI from looking at who's checked out books on building a bomb."

Libraries must be careful also to honor contractual agreements that limit access to proprietary databases provided by information vendors, Antnes said.

She said the university library hasn't suffered from the Telnet problem addressed in the CIAC advisory, but a student was able to break into a system and delete library fines for some friends.

Christensen said he recently helped a library, which he declined to name, track an intruder through a chain of five libraries linked via the Internet. The intruder was able to change system variables at each library to disguise his identity. Protected by this anonymity, he posted a large volume of offensive material to an Internet newsgroup.

## Hello, operator?

**T**elephoning over the Internet could be cheaper than Ma Bell

By Kim S. Nash

### Watch out, AT&T

A few companies are trying to bring long-distance telephone-like calls to the Internet. The results could save business and home users a bundle when compared with traditional phone rates.

Users of PCs outfitted with multimedia gear would be able to talk to one another over the Internet, wherever they may be, for the price of a local call to an Internet service provider.

As long as they have an Internet account, PC sound board, microphone and modem, everyone from college kids calling home to talk to mom to companies with remote offices could cut the amount they would otherwise pay to AT&T Corp., MCI Communications Corp. or Sprint Corp. for traditional long-distance calls. "That could really be something," said Jerry Mariani, a manager at a large regional Bell operating company.

Mariani noted that although his firm might see this technology as a threat, he personally would like to see it come to fruition.

### Taking on the big guys

Indeed, several small companies want to provide technology to help users end-run the giant long-distance carriers.

VocalTec, Inc. in Northvale, N.J., recently unveiled Internet Wave, an audio communications package for Microsoft Corp.'s Windows 3.1 and Windows 95. The product lets users hear real-time audio signals from other users also running

Internet Wave or listen to prerecorded material. A free trial version of Internet Wave can be downloaded from the World Wide Web at <http://www.vocaltec.com>.

International Discount Telecommunications, an access service based in Hackensack, N.J., filed a patent for similar technology late last month.

Most initial Internet calling products will be half-duplex, similar to citizens band radio, an International Discount spokesman said. With this technology, users can talk at a time can speak, or broadcast, during a conversation.

### PC + Internet = telephone

**While voice-to-voice Internet telephone service may be a few years away, the worldwide network is getting more audited**

• RealAudio from Seattle-based Progressive Networks lets users with multimedia PCs penuse and play snippets of sound found on the Internet. This free software can be downloaded at <http://www.realaudio.com>.

• Quarterdeck invested \$1.5 million into last month in Lucent & Hauppauge Speech Products in Woburn, Mass., to help speed development of Quarterdeck's forthcoming WebPhone product.

• Cambridge, Mass.-based Bolt Beranek and Newman seeks to combine audio with video in its Tivo router for videoconferencing over the Internet. The Tivo router, which recently entered beta testing, is aimed at users who want to avoid buying and maintaining separate videoconferencing gear.

# http:

**Data warehousing whereabouts**  
Beginning data warehousing managers may want to turn to the World Wide Web for a quick electronic education on the topic. Last week IS press information, who originally developed the Data Warehousing Information Center, the site is at <http://www.informationcenter.org/warehousing.html>. It contains links to other warehousing pages as well as pointers to articles and white papers on the topic.

Perhaps most useful, though, are Greenfield's "Personal Home and Pages" page. They offer practical tips from someone who has been there and done that, including advice on building a warehouse and common problems to avoid.

■ **Spectrum Reports**, a market research firm based in the U.K., offers several reports and how-to papers that focus on the benefits of building a data warehouse. See <http://www.spectrumreports.co.uk/reports/spectrum.html>.

■ Several software and hardware vendors have pages at their Web sites dedicated to warehousing. Most give product descriptions and some case studies. SAP, for example, however, has created a document titled "white paper" that explores warehouse architectures, terminology and possible applications. Check out <http://www.sap.com/sapinfo/warehouses/whitepaper.html>.

— Kim S. Nash

**Open Last week in our list of cache-enabling Web pages, we left out our own, at <http://www.computerworld.com>.**

Christensen advised against the use of a "fully functional" Telnet client on systems that permit public access. Instead, he said to use a version that has been modified to block users' ability to enter the command prompt, which gives users privileges necessary to escape the restricted environment (see chart).

And firms shouldn't scrimp on set-up costs. "As everyone races to make their services available on the Internet, they overlook the basics. In the long run, they would probably save money if they did it correctly up front," he said.

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## Enterprise Networking

# HP network speeds LAN diagnosis

System lets staff handle problems from their desks

By Patrick Dryden  
ATLANTA

**M**ark Conroy made sure that his support staff would never again have to leave their department to diagnose LAN problems.

Conroy, a telecommunications engineer in Hewlett-Packard Co.'s Corporate Network Services group, took advantage of a data center move to build a new network that makes troubleshooting internal networks vastly easier. Conroy's group provides support for the data center and IP field operations throughout the Western Hemisphere from the new Atlanta Technology Center here.

The system was designed to let support personnel handle network problems from their desks because finding a protocol analyzer and lugging it to the suspect segment took too long, Conroy said.

Applying a protocol analyzer was the last effort to find and fix a problem. That process took 20 to 40 minutes just to locate the tool, followed by the hassle of

dragging it to the caller's LAN, finding a port to plug it in, then attempting to duplicate the problem, said William Pace, an HP information technology specialist.

In the new, streamlined process, a separate management network links every LAN in the data center to a single analyzer run by the 10-person Corporate Network Services group on the 14th floor.

"We do all the troubleshooting from upstairs now," Conroy said. "We can examine traffic and packets on any segment during a call, and nobody has to mess around inside the data center cables."

#### Immediate testing

In the past, network supporters would waste a lot of time on a call without any kind of visibility into the segment, Pace said.

"Now we jump right to the analyzer earlier in the problem resolution cycle, after checking basic configuration," Pace said. "We can test immediately instead of trying to do everything possible beforehand."

Quick analysis eliminates finger-pointing when someone complains that the network is down, Conroy said. And the ability to easily capture transaction packets lets the network support group help evaluate the performance of systems and the impact of new applications.

Separate cable runs and physical-layer switches create a path between a 14th-floor analyzer and any Ethernet segment in the building.

Every hub connects in multiport switches from Atlanta-based LAN-hopper Systems, Inc., which connect to other LAN-hoppers in the support group. That configuration prevents blind spots caused by bridging in the data center, where servers on individual segments funnel through ES/1 Ethernet switches from Standard Microsystems Corp. in Hauppauge, N.Y.

#### Streamlined troubleshooting

When Hewlett-Packard built a new site for its data center and operations, network designers added a separate network to improve management.

#### Problem

Network support staff

couldn't diagnose

Ethernet segments

quickly and easily. They

had to haul a protocol

analyzer to a user's LAN

or a server link in the

data center.

#### Solution

Wire a series of switches

that link all hubs back to

a protocol analyzer in the

network services

department. Now staff can

establish a connection with

any suspect segment to

view traffic and capture

packets.

From the HP OpenView management console, network supporters run scripts that establish the desired connection through the LAN-hoppers. Then they can view and capture packets on a Sniffer protocol analyzer from Network General Corp. in Menlo Park, Calif.

"Adding some wires and incidental links was worth the cost, so we could respond quickly to problems in the data center and every floor of this new building," Conroy said.

## The Microsoft Network

CONTINUED FROM PAGE 67

consumers, the on-line technical forums in CompuServe, for instance, provide excellent values for information systems managers. We found MSN wanting.

The upstart from Redmond, Wash.-based Microsoft Corp. is gaining momentum, though, as was witnessed in our two trips through the service.

#### Review

**First look**  
In our first visit to MSN's electronic landscape, we found a Hollywood-type city. We saw the expected assortment of content and services, including electronic mail, chat, file downloads, news, bulletin boards, arts and technology sites. But many sites were still under development, as evidenced by their sparse or even empty databases.

Indeed, some of the operating sites were actually advertisements, masquerading as features. For example, most of the computer magazine sites' limited content was designed to elicit subscriptions. This unbridled commercialism extended to other areas. On the plus side, however, the service was pleasing to the eye and easy to use.

Microsoft promised to fill its content gaps and add new services. A second visit one month later showed real progress. We uncovered a variety of new forums, features and incremental content improvements.

As one might expect, Microsoft wants MSN to appeal to consumers. It also has promised features meant to appeal to business users, such as private forums and secure chat centers.

But these won't appear until the first quarter of 1996.

MSN keeps users waiting for content, both in terms of its existence and how long it takes to get to it. The service doesn't support modest traffic faster than 14.4K bits/sec., which we found minimally tolerable for the service's rich graphics.

The modern support may be one factor delaying the amount of content on MSN. Microsoft officials deny that their competitors offer faster performance but nevertheless plan an upgrade before year's end that they say will significantly improve performance.

#### Tricks of the trade

In the meantime, Microsoft resorts to some clever tricks to enhance performance. For example, a progressive graphic-rendering technique lets text appear sooner, enabling the user to read the text while the graphics gel. Users can also click out of the site before the graphics fully materialize.

Other time-savers include designating selected sites as "Favorite Places," enabling a single click return; using a "go" command to jump directly to a site (similar functions are available on CompuServe and America Online); and using the "list" display mode for a site, bypass-



The Microsoft Network's basic interface is simple and straightforward

ing the site's graphics and icons.

The best trick of all is increasing MSN's default access speed of 14.4K bits/sec. To get 28.8K bits/sec. modern access you have two choices. You can download a free TCP/IP utility from Microsoft's Internet Center or purchase Microsoft Plus, a \$49.95 add-on.

Aside from faster access speeds, Microsoft Plus provides goodies such as theme screen savers, animated icons and desktop management utilities. In addition, Microsoft Plus offers full Internet access, whereas the MSN version that ships with Windows 95 offers only E-mail, file transfer protocol and newsgroups on the Internet.

Unfortunately, when we added Microsoft Plus, our machine emitted an endless stream of error messages, locked up and, in general, mortized. It took several hours and several minor mir-

acles to solve the problem.

This happened on a Sunday, so when Microsoft's product managers called back Monday, we had resolved the problem. Microsoft offered to help determine the cause of the problem, but we didn't want to deliberately recreate it.

Microsoft plans to handle MSN and Internet access from Windows 95 early next year. Other improvements coming in the first quarter will enable MSN, currently single-user only, to operate on Windows NT LANs and Novell, Inc.'s NetWare. Later next year, it will release Windows 95 and Macintosh-specific versions. Designed for 32-bit systems, MSN won't run on Windows 3.1.

MSN's tight integration with Windows 95 does offer convenience and performance benefits. They share an easy-to-use interface, multitasking and a memory management system. You can drag and drop an Internet hyperlink, a World Wide Web home page or a "Favorite Place" icon onto the desktop or into a folder or document. Clicking on it launches MSN and delivers you directly to your destination.

Millman is an independent consultant based in Croton, N.Y. He can be reached at millman@millman.com.

## Test procedure

For our unstructured tour of MSN and its Internet companion, we used a 48-MHz 486DX2 box, rigged with 16Mbytes of RAM and a 28.8K bps/Sec. modem. We spent

about two hours meandering through the service's electronic landscape, visiting a dozen or so news, entertainment and technical information sites.



THE RACE BEGINS OCTOBER 30.



Time in to the first database launch on the Internet: <http://www.sybase.com> on October 30. ©1995 Sybase, Inc. Sybase and the Sybase logo are trademarks of Sybase, Inc.

**Centigram Communications Corp.** has introduced the Series 6 line of communications servers.

The San Jose, Calif., company said the Series 6 servers are next-generation hardware and software platforms for integrated voice, fax and data messaging.

The products expand users' choices in communication vehicles and provide access to a broad range of messaging options, including telephony applications, remote access, one-number services and digital connectivity.

The Series 6 servers are based on Centigram's modular expandable system architecture for system and application expansion. They offer up to 240 ports and 2,880 hours of storage in a single system

and maintain a consistent user interface and software base across all models. They include TCP/IP Ethernet connectivity, letting users digitally exchange messages among as many as 1,500 system nodes and at speeds of up to 10M bit/sec.

Pricing for the Series 6 servers starts at \$9,500.

► **Centigram Communications**  
(408) 944-0550

**Olivcom, Inc.** has introduced the Ethernet ISA/IV family of Industry Standard Architecture (ISA) adapters.

According to the Plano, Texas, company, the adapters are available in two models: the ISA/IV CAT Adapter and the ISA/IV/T Adapter. The ISA/IV CAT Adapter supports a variety of media types, including coaxial baby "N" connector for direct connection to thin Ethernet coaxial cables. The ISA/IV T Adapter has an RJ45 connector.

The adapters feature 32K-bit buffer memory to reduce traffic overhead and 32-bit drivers for increased performance and lower CPU use. Drivers are supplied for major operating systems such as Novell, Inc.'s NetWare, IBM's LAN Manager and Microsoft Corp.'s LAN Manager, Windows for Workgroups and Windows NT.

The ISA/IV CAT Adapter costs \$85. The ISA/IV/T Adapter costs \$62.

► **Olivcom**  
(214) 423-7899

**The AG Group, Inc.** has unveiled NetMeter 1.0, a real-time network monitoring application for Macintosh networks.

According to the Walnut Creek, Calif., company, NetMeter 1.0 displays network traffic data in various customizable meter formats. Each meter is a visual or audio presentation of specific pieces of network information selected by the user that allows network managers to focus on devices and traffic important to their specific network environments.

NetMeter 1.0 lets users view data collected by AG Group's Satellite data collection engine. It provides real-time information with a variety of data options, including overall network use; single node, single protocol or subprotocol; and specific conversations.

Pricing for NetMeter 1.0 starts at \$395. The package includes the NetMeter application, eight Network Modules and one Satellite data collection engine.

► **The AG Group**  
(510) 837-7900

**Focus Enhancements, Inc.** has introduced EtherLAN Hub 16 V, a stand-alone 16-port repeater hub.

The Woburn, Mass., company said EtherLAN Hub 16 V has 16 10Base-T ports and one port for unshielded twisted pair connectivity with PCs, Unix workstations and IBM AS/400s.

A baby "N" connector provides thin Ethernet connection allowing up to 30 devices to be joined through standard coaxial cable and T-connectors. EtherLAN Hub 16 V can also serve as a node on any thin Ethernet backbone or segment.

The product provides automatic partitioning and reconnection. It can be cascaded with another EtherLAN Hub 16 V using standard 10Base-T cabling. It also includes its own power switch and internal power supply.

EtherLAN Hub 16 V costs \$490.  
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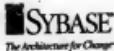


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To see it in the first database launch on the Internet: <http://www.sybase.com> on October 30. ©1995 Sybase, Inc. Sybase and SQL Server are trademarks of Sybase, Inc.



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# Large Systems

HARDWARE • SOFTWARE • CORPORATE STRATEGIES

## OS/390 bundle to save hassle

By Craig Stedman

If change is good, then System/390 shops have some great times ahead of them.

IBM's plan to bundle its MVS operating system with several dozen supporting products should completely alter the way software is viewed in data center life. If the strategy works, it will release customers from having to painstakingly upgrade mainframe software one piece at a time, in what amounts to a never-ending cycle of integration and testing.

Detailed this month and due to ship next March, the new OS/390 environment is supposed to shift much of the software integration burden, and its high cost, to IBM. A half-dozen System/390 users applauded that idea and also approved of the price breaks that IBM said will accompany the bundling.

But some users said the magnitude of

the upcoming changes is a bit daunting since customers will be asked to make a leap of faith and put their trust in IBM's integration skills. IBM must also still flesh out many of the details of OS/390, starting with pricing, users said.

"There are all kinds of questions that IBM has to answer," said Paul Moore,

manager of data processing operations at Huntington Service Co., the information systems unit of Huntington Bancshares, Inc. in Columbus, Ohio.

"The concept is great, and I hate to be skeptical, but on the other hand, I am."

IBM has "seen the handwriting on the wall and figured out this is where they have to go" to make mainframes more competitive with smaller servers, said Jeff Grigg, principal technical support analyst at Beth Iroa Works Corp. in Bath, Maine. But plans to augment the initial OS/390 bundle with database, transaction processing and third-party software are "very nebulous" and could ask customers to swallow too much change at once, Grigg said.

Charlie Burns, an analyst at Gartner Group, Inc. in Stamford, Conn., said the long-lead-time nature of OS/390 will let manufacturers adjust their testing cycles and install software on a more defined schedule. Today, updating MVS "is kind of like painting the Golden Gate Bridge. There's always something that needs to be done," Burns said.

However, IBM has to prove to data center managers that its standardized integration and testing fits the bill. With OS/390, "you're changing everything in the shop. That's something most people look at with a reasonable amount of concern," Burns noted.

Charles Lickel, vice president of System/390 business plans and systems architecture at IBM, agreed that customers "have to build up their confidence level as to how much change they're willing to make at one time."

IBM still will let users buy and install

### Get it together

These key software products will be part of the base version of IBM's new OS/390 mainframe operating system:

- MVS/ESA 4.2.2 operating system
- DFSMS storage manager for active data
- JES2 job-entry scheduler

- OpenEdition MVS with support for Data APF
- OpenEdition shell, utilities and debugger

- VTAM 4.3 terminal-to-host software
- TCP/IP 4.3 API
- OpenEdition DCE base services
- LAM Server for MVS

- S/390 objects object request broker
- VisualSoft graphical user interface

\*Routine versions

existing versions of MVS and the other bundled products one piece at a time. Lickel said. But future releases will be sold only within OS/390, he said.

OS/390, page 8d

## Translation software picks up steam as demand booms

By Dan Richman

Remember the joke about the literal-minded interpreter who translated the English expression "Out of sight, out of mind" as "Invisible, insane"? That is not too far-fetched when applied to software that translates human languages — a technology that remains primitive even after decades of effort.

Yet the market for translation software is booming.

"I doubt anything will ever replace human translators, but we consider computerized assistance invaluable here."

— Jonathan Yanover,  
translation manager,  
Atlanta Committee for the  
Olympic Games

Orvan Ltd., a computer industry analysis firm in London, predicts that the current \$200 million market for translation software will balloon to \$1.5 billion by the year 2000. The greatest growth will take place in software for Japanese translation.

Users say translation software, while not a sledgehammer to bring down the Tower of Babel, is nonetheless indispensable.

"I doubt anything will ever replace human translators, but we consider computerized assistance invaluable here," said Jonathan Yanover, translation manager of the Atlanta Committee for the Olympic Games, which is readying the infrastructure for the Centennial Olympic Games in July 1996. "Our documents are widely varied and numerous. We'd be lost without computerized help."

Translation software can be used to any company working in more than one language. The most challenging—but disappointing—technology is called machine translation. It parses sentences and automatically renders words and short phrases in another language.

But computer science thus far has been unable to re-

Translation software, page 8d

### Philips Semiconductor addresses backlog

**The business challenge:** Semiconductor stocks have taken a beating on Wall Street lately as analysts heighten their concerns about swelling computer chip inventories. To help reduce its backlog and measure customer profit margins more effectively, Philips Semiconductor in Sunnyvale, Calif., recently began installing a data warehouse based on Information Builders, Inc.'s focus.

**The technology used:** Philips' mainframe-based data warehouse was designed to capture worldwide sales data from 43 sales databases across North America, the Far East and Europe. Sales data is extracted from these databases on an ASCII file, electronically transmitted over TCP/IP networks to Philips' Sunnyvale data center and uploaded onto the Focus data warehouse, which resides on a Toshiba America Information Systems, Inc. mainframe running IBM's VM/VMM operating system.

**Project costs:** Software for Information Builders' Focus Executive Information System (EIS) for Windows application programming, \$50,000 per seat, for 50 users; software and \$100,000 to be allocated to a dedicated controller in the Sunnyvale Advanced Circuits Business Group at Philips Semiconductor in Sunnyvale.

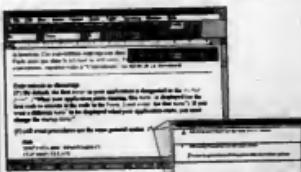
### Business benefits achieved/expected:

Using Focus EIS, Philips' 20 sales and marketing executives from Philips' U.S. and European operations can access daily sales information from the U.S. and monthly sales statistics from Europe and the Far East. This information is stored in Philips' Focus/VM database in Sunnyvale.

The company's manager needs to validate 300 to 400 programmers to extract product-specific sales information for Philips executives.

By Thomas Hoffmann

Philips' IT department in Sunnyvale no longer has to print out 200 lbs. of monthly sales data for sales executives to weed through, according to PJ Mezner, a former program manager at the microcontroller products group at Philips Semiconductor.



Word processors such as Microsoft's Word increasingly offer foreign-language translation

Smart Hub.

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## Large Systems

# Vendors take aim at metadata standard

Six join effort to bridge warehousing products

By Dan Richman

Six vendors involved in data warehousing have pledged to lead a drive toward standardized metadata, which they say will let users map and match multiple vendors' warehousing products.

Metadata is information about data in a warehouse. It is as essential as the data itself, telling users how the data was created, where it is from, what it means, how it has been summarized or quantified and how it has changed over time.

Every product in the data warehousing market requires metadata, and some generate it. But each product uses a slightly different format.

That means, for example, that a site using one vendor's end-user query and analysis tool might require significant information technology assistance to use another vendor's data extraction and cleansing tool to extract data from production databases.

## Keeping the edge

To fix this problem, the vendors — Arbor Software, Inc., Business Objects, Inc., Cognos Corp., Evolutionary Technologies, Inc., Platinum Technology, Inc. and Texas Instruments, Inc. — on Oct. 10 formed the Metadata Council, which, along with one end user, will release an initial specification by year's end, officials said.

## Briefs

### Analysis tool to be ported to MVS

Mortice Kern Systems, Inc. will port its Code Integrity source-code analysis tool to IBM's OpenEdition MVS mainframe operating system. The new version will ship in the first quarter of 1996.

### Compuware gets connected

Compuware Corp. in Bloomington Hills, Mich., has introduced EcoConnect, a component that links the company's EcoTools system and application management product to leading management platforms and help desk applications. EcoConnect integrates EcoTools with Hewlett-Packard Co.'s OpenView, IBM's NetView, SunSoft, Inc.'s Solitaire and Tivoli Systems, Inc.'s Tivoli Management Environment. EcoConnect is available now; prices start at \$25,000 and depend on system configuration.

The specification will set out the format and structure that metadata should take to be interchangeable among competing vendors' products. But it will also allow for extensibility, so vendors can keep competitive advantages, she said.

One user reacted optimistically to the council's formation:

"That kind of standard would be enormously valuable," said Andrew Black, decision-support manager at Dayton-Hudson Inc., a retailer in Minneapolis. "We've got three divisions using different tools, each with its own metadata needs, which you think about it is sort of vendor lock-in. It sounds like this could lead to having all those tools with only one metadata format."

But users won't receive any benefit until 1997, predicted Metro Group, Inc., a Stamford, Conn., consultancy that said it coordinated the council's creation to advance its end-user clients' interests.

"We all felt pressure from users who want to choose whatever products they want and be able to exchange metadata without coming up with homegrown remedies," said Patti Nguyen, co-chairwoman and vice president of technical services at Business Objects.

At least one other vendor — Prism Solutions in Sunnyvale, Calif., a data extraction and cleansing company — has said it intends to participate in the council's efforts.

### Scheduling software for RS/6000 due

Poorth Dimension Software, Inc. in Irvine, Calif., is expected to announce this week that its Control-M production control and job scheduling software will become available this year for IBM's RS/6000 parallel processing computers. Contro-M 9000 SP pricing starts at \$5,400 per node; the related Enterprise ControlStation Component starts at \$15,995.

### Encore releases disk array

Encore Computer Corp. in Fort Lauderdale, Fla., has introduced an expanded version of its Infinity 8P disk array that supports data sharing between mainframes and other servers. Scheduled to ship this quarter, the SP-90 uses a ring-like architecture similar to what IBM is designing for its multiautonomous MassStorage storage devices due out in 1996. Multiple SP-90 controller nodes can be linked together, with each group of two supporting up to 6960 bytes of disk storage, Encore said.

## Large Systems

## Translation software vendors

Machine Translation		Automatic translation of words and short phrases	
Product	Logos	• Transcend	System Translator
Vendor	Logos Corp. Mount Arlington, N.J. (201) 398-8710	Intergraph, Inc. Huntsville, Ala. (305) 730-3046	Syntex Software La Jolla, Calif. (619) 459-6700
Platforms supported	SPARC Solans, Sun OS	Transcend (Windows); DP Translator (Intergraph Unix)	MVS, Unix, Windows

## Translation memory: Database storage and searching for larger phrases and sentences

Product	TM2	Optimizer	Translator Workbench
Vendor	IBM Armonk, N.Y. (800) 426-4862	EumLang Paris (800) 898-9043	Tradis, GmbH Stuttgart, Germany (619) 298-8300 (619) 794-6399
Platforms supported	OS/2, Windows	Client: Windows Server: NT Server	DOS, Windows

## Translation

CONTINUED FROM PAGE 81

Create in silicon the ability to understand context, making machine translation products useful only for limited sets of words, such as parts lists. Only incremental improvements can be expected, several vendors said.

Another technology, called translation memory, stores manually translated phrases and sentences in a database and matches them with the document being translated. If it is useful for longer documents, such as sales brochures and computer documentation, improvements in fuzzy logic and indexing will likely propel this technology to greater efficiency.

Fueling the growth in translation software are new integrations of products, availability on less expensive platforms and the growing internationalization of business, said Brian Briggs, president of SciTech Language Partners, Inc. in Chicago, a supplier of translation software.

An increasing number of vendors are integrating machine translation software and translation memory packages. When a match for a word or phrase is not found in the translation memory database, the string is kicked into machine translation, said Mark Berry, president of MCB Systems, a translation software

reseller in San Diego.

Several products are also being integrated with one or more vendors' word processors so that translations can be easily initiated from and incorporated within documents.

Translation software is increasingly available on inexpensive platforms. For example, Intergraph, Inc., a workstation and server vendor in Huntsville, Ala., ported its Transcend machine translation product from Digital Equipment Corp. Unix to Microsoft Corp.'s Windows NT about a year ago. Most other translation software vendors also have ported their products to NT, some just within the last year.

The next hurdle that translation software faces is handling Japanese, a special challenge because of its use of ideograms rather than letters.

"Japanese is definitely next on the list" of languages that on-line service ComputerServe will add to its World Community Forum, which automatically translates messages in English, French, Spanish and German bidirectionally, said Mary Flanagan, group leader for natural language technologies in Waltham, Mass.

Companies need automated translation will pay "from about \$500 for something to roughly translate E-mail messages to \$50,000 for a system that puts manuals and documents into another language," Briggs said.

## OS/390

CONTINUED FROM PAGE 81

IBM plans to update OS/390 every six months by adding new versions of products that are ready at that time. Pricing isn't finalized, but the bundling could shave up to 30% off monthly license fees at large mainframe shops and 50% at smaller sites, Lickel said.

Actual savings will depend on how much of the bundled software customers already have and how old it is. Since IBM's prices usually rise with new re-

leases, the discounts "won't be as big if you consider the packaged [OS/390] price against older versions" of software, Burns said.

But even then, the reduced integration and test load should be kind to IS budgets.

OS/390 "would never be a plug-and-play type thing because [MVS] is the lifeblood of our company," said Virgil Pittman, senior vice president of IS at Fireman's Fund Insurance Co. in Novato, Calif.

"But in principle, we should be testing all of that once rather than having to set up a different test for each piece."

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**Prism Solutions, Inc.** has announced Prism Warehouse Manager 4.3, data warehouse management software designed to reduce the time and cost of building and maintaining data warehouses.

According to the Sunnyvale, Calif.,

company Prism Warehouse Manager 4.3 is an open architected data warehousing product. It includes robust data extraction capabilities, advanced transformations, active metadata collection and support for multiple source and target databases on mainframe and client/server platforms.

The product has productivity enhancements, including data mapping for flexible processing of source files. It

also provides support for SAP America, Inc.'s R/3, IBM's AS/400 and Teradata Corp. sources.

Prism Warehouse Manager 4.3 includes features for many-to-many mappings to allow inputs from multiple source file types, warehouse updates to let users replace, insert or delete rows in data warehouses, the reuse of business rules and user exit routines; and IMS direct read

The product extracts data from SAP, R/3 applications on Digital Equipment Corp. and Unix platforms, DB/400 databases on AS/400 platforms and Teradata databases on IBM MVS and AT&T 3000 Unix platforms.

A Prism Warehouse Manager 4.3 license is \$120,000 and includes a transformation module with three concurrent developer workstation seats, one source database module and one target database module.

► **Prism Solutions**  
(408) 752-1888

**Lingo Computer Design, Inc.** has introduced Fiscal.

Fiscal is a complete open architecture for rapid implementation of on-line analytical processing (OLAP) and decision support. According to the Toronto company, Fiscal is the most extensive architecture for OLAP.

It features a multidimensional OLAP server that runs native mode on Oracle Corp., Sybase, Inc. and Informix Corp. database management systems on any server hardware. It also has an end-user data exploration tool that runs on popular graphical user interfaces, including Microsoft Corp.'s Windows and Windows NT, IBM's OS/2 Presentation Manager and the Macintosh.

Fiscal includes corporate modeling technology that permits top-down design and tools for the creation of an operational data store or data warehouse.

Pricing for Fiscal starts at \$85,000 for a 25-user license.

► **Lingo Computer Design**  
(416) 589-5334

**Client/Server Technology, Inc.** has introduced GUIsys 3.0, legacy migration software.

According to the Atlanta company, GUIsys 3.0 offers fully automatic migration of mainframe and midrange legacy applications to a client/server environment under Windows or OS/2. It was designed to make the migration of legacy applications to Windows-based applications as seamless and transparent as possible.

GUIsys 3.0 features KnowledgeBase, which a company can customize according to the particular standards found in its legacy system. The KnowledgeBase monitors the flow of an application while it is in use and analyzes the way the screen is presented to the user.

The product combines this information with corporate preference format information to automatically convert character-based screens into customized Windows-based screens without changing the original program code.

GUIsys 3.0 features multiple session support, full accelerator support, automatic application development and advanced message handling. It creates graphs from the data in host subfiles, including invisible pages, and a uniform graphical user interface.

Pricing for GUIsys 3.0 starts at \$13,500.

► **Client/Server Technology**  
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# Application Development

CASE • LANGUAGES • TOOLS

## OLE gets graphic

Prospero 'building blocks' can help developers link, write apps

By Frank Hayes

Almost every major PC application that runs under Windows supports OLE, Microsoft Corp.'s system for linking software components. But almost no corporate development shop uses it to its full extent.

OLE technology makes it relatively simple for users to link applications. For example, a user can merge a piece of a spreadsheet into a word processing document. OLE also can perform more complicated tasks, such as moving data between applications automatically, by using OLE automation.

But most corporate developers shy away from using these capabilities because writing applications that use OLE programming interfaces has been notoriously difficult.

Instead, developers typically write

macros to export the data from one application and import it into another, said Diana Leesee, a technical specialist at VP Solutions, Inc. in Framingham, Mass. Now on the scene is Prospero, a development tool from Object Software, Inc. in Cambridge, Mass. Prospero was designed to make it much easier to use OLE by giving developers and power users a graphical environment in which to link OLE-enabled applications, said Leesee, who beta-tested the system.

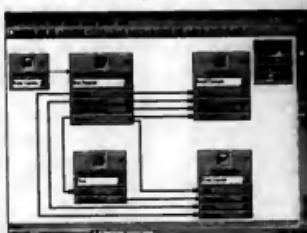
Prospero also lets you link data from databases that use Microsoft's Open Database Connectivity protocol and applications using Notes.

From each application or database, Prospero automatically generates "building blocks" that represent data or an application function. Developers then link data and functions by drawing lines between them using a mouse. If the task

is to feed mailing list information from a database into a word processor, "Prospero builds a block with all the fields in the database, and then all you do is draw a line to connect it to all the places you want it to go inside your word processor," Leesee said.

Developers also can use Microsoft's Visual Basic-compatible scripting language to create their own building blocks that contain dialog boxes, formvars and if/then/else logic to make even more complex connections between applications.

The connections between the building blocks can be developed and tested un-



Prospero's Prospero generates "building blocks" that represent data or application functions. Developers can link data and functions by drawing lines between them using a mouse.

der Prospero, then used to generate an executable file that runs using only a Dynamic Link Library (DLL) file. There is no runtime charge for the Prospero DLL.

Prospero runs under Microsoft's Windows 3.1, Windows 95 and Windows NT. It is shipping now and costs \$995.

## IS, users take team approach

Business process re-engineering gains popularity, improves efficiency

By Frank Hayes

It is really no wonder that businesses and corporate developers have a hard time communicating. The former are concerned with creating, buying, and selling goods and services, while the latter are focused on moving and transforming data. What a business user tries to describe in terms of customers and inventories, a developer sees as entity relationship diagrams.

Bridging the gap between the two worlds isn't easy.

### Working together

A popular approach is business process re-engineering (BPR), where developers don't just computerize existing systems. Instead, they work with users to determine how work and information move among business functions and then design a system that will make the business more efficient. Only then is the software actually developed.

BPR "allows the system designer to better understand the

business, and for a business analyst to really question the efficiency of the process before [going] into a systems design," said Brad Masters, senior business systems analyst at Welschcraft Technologies, Inc. in Hornbeam, Pa.

"Re-engineering gains its strength from redesigning business processes and information systems at the same

time," Masters said.

Unfortunately, today's BPR tools tend to be simple workflow-diagramming tools or elaborate systems aimed at large-scale development.

**Middlelevel target**  
Taking the middle ground is Sterling Software, Inc., which is targeting the needs of users who want to design and build workshop-size applications.

The Atlanta-based company last week rolled out Key for Workgroup, a Windows-based BPR tool set that lets users and developers analyze workflow and generate applications.

Developers and business analysts can model a business's current organization and flow of operations, said Earl Sabot, a systems analysis at Cypress Application Solutions, Inc. in Roswell, Ga., who beta-tested Key for Workgroup.

The development system then can generate application code directly from the

business model, Sabot said. Key for Workgroup comes with Sterling's Key-Assembler, its own rapid-development language, and components for generating applications.

Developers also can generate code in Microsoft's Visual Basic using a Key-Empower for Visual Basic module, or in PowerBuilder Corp.'s PowerBuilder using a Key-Empower for PowerBuilder module, Sabot said.

"This consists of going from BPR directly to rapid development," said Mike Siebar, a research director at Gartner Group, Inc. in Stamford, Conn.

"BPR will be replacing all other means of planning over the next several years. It will also lead directly into object-oriented analysis and design and the use of object-oriented tools," he said.

**Pricing set**  
The Key for Workgroup suite is available now. Pricing starts at about \$25,000 for four concurrent users. Individual parts of the suite can be purchased separately at \$1,400 for Key-Assemble, the analysis module; \$4,500 for Key-Model, the modeling module; \$5,400 for Key-Assembler; and \$1,400 for Key-Empower for Visual Basic or Key-Empower for PowerBuilder.

### Briefs

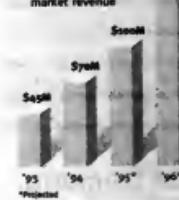
#### Pipes Platform ships

PeerLogic, Inc. in San Francisco last week introduced an enhanced version of Pipes Platform, the company's middleware that allows applications on different platforms to communicate. Enhancements include management utilities, expanded network support for Novell, Inc.'s NetWare and Microsoft Corp.'s Windows NT, and support for connecting Microsoft Visual Basic applications to Unix or mainframe-CICS applications. Pipes Platform is shipping now. Pricing starts at \$200 for Windows, \$1,200 for Unix and \$65,000 for mainframe-MVS environments.

#### Benchmarking boom

The International Standards Organization Group has come to the U.S. The group, which is made up of members from European and Australian software metrics associations, works on user-oriented standards for software benchmarking.

Taking off  
Business process re-engineering tool market revenue



Source: Gartner Group, Inc., Stamford, Conn.

## Application Development

# Companies hop on-line with tool from Australia

By Emily Giu

A company Down Under recently released a tool designed to help companies get up on the World Wide Web.

Australia's Open Software Associates (OSA) has introduced OpenWeb, which it claims is the only tool that creates client/server applications for both private networks and the Internet.

OpenWeb is an application development technology that enables a company to place distributed applications on the Internet. The technology is built into OSA's OpenUI product, which is a client/server graphical user interface application development environment that works across multiple platforms.

OpenUI is a message-based architecture and cross-platform user interface management system.

John Schmidt, OSA's marketing development manager for Asia, said more companies are using the Internet infrastructure as a cost-effective way to extend their private networks. This means they have a need for a distributed application development tool. OpenUI lets developers use Cobol, C or C++ as their programming language. OSA is targeting large organizations for its OpenWeb and OpenUI products, such as major financial and banking institutions and telecommunications companies.

While OSA won't provide a security product for its clients, it will assist them in implementing a security system and ensuring the compatibility of the system

with OpenUI. OpenWeb works with standard user authorization, authentication and encryption security technologies, Schmidt said.

Corporate client/server applications and databases intended for the Internet can remain on the company's internal

network and don't need to be transferred to a Web server. To allow access to the client/server application from the Web, developers must create a link on their home pages that points to the downloadable client application module or user interface on the Web server.

Once the connection is made between the Web server and the internal network application, OpenUI's message-based architecture passes all application calls to the internal corporate server.

Giu writes for Computerworld Hong Kong.

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**Softool Corp.** has introduced CCC/Harvest 2.0.

According to the Goleta, Calif., company, CCC/Harvest 2.0 manages application development processes and software changes in cross-platform client/server environments. The product was designed for platform interoperability. It supports UNIX, Microsoft Corp.'s Windows and Windows NT, IBM's OS/2 and OpenVMS and Macintosh.

Pricing is based on concurrent users and starts at \$1,500 per user.

► **Softool**  
(805) 693-5777

**Terasoft Technology Corp.** has introduced OEW for C++.

According to the Milford, Mass., company, OEW for C++ is a productivity tool kit for C++ developers. It includes reverse-engineering capabilities that promote the reuse of any C++ code, not just the code it produces. The product is available in English and German for Microsoft's Windows, Windows 95 and Windows NT, and IBM's OS/2 Warp. It costs \$795.

► **Terasoft Technology**  
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**C**hances are you're altogether too familiar with "simple questions" like these. Invariably, they come at the worst possible times. Usually, they require immediate attention. And, more often than not, there's hardly anything simple about answering them. Unless, of course, your organization is one of the thousands that have come to rely upon LightShip®, from Pilot Software, for the power of answers on demand.

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## Answers on Demand.

## Application Development

**Xerox Corp.** has announced TextBridge Application Programmer Interface (API), supporting Microsoft Corp.'s Windows 95 and Windows NT operating systems.

According to Xerox's Imaging Systems division in Peabody, Mass., TextBridge API is a C/C++ developer's tool kit de-

signed for integrating high-end optical character recognition capabilities into third-party applications using Microsoft's Visual C/C++ development environment.

TextBridge API features a natural language system for increased recognition of words commonly found in business documents that aren't true words. It includes support for 12 foreign lan-

The product also has automatic preprocessing capabilities, including page segmentation, rotation and noise removal.

It recognizes font sizes between five and 72 points and supports open-faced books and magazines.

Pricing for TextBridge API's basic tool kit starts at \$5,000.

► **Xerox**  
(508) 977-8000

**Geodecic Systems, Inc.** has unveiled Great Circle, an automatic memory management product for C and C++.

According to the Chicago company, Great Circle automatically prevents and finds memory management bugs, memory leaks and loose pointers without requiring any source code changes. It analyzes a program's data structures and automatically frees any memory no longer in use.

Great Circle was designed for programmers of all skill levels working on new and existing source code. It facilitates the reuse of existing code and includes garbage collection technology that eliminates the need for application-specific memory management schemes. It provides a C/C++ smart pointer interface and is available in compiler and operating-system-independent C++ source code that lets developers target device drivers, unusual platforms and embedded systems.

Pricing for Great Circle starts at \$300 for PC versions and \$700 for workstation versions.

► **Geodecic Systems**  
(312) 726-7196

**JYACC, Inc.** has introduced Jam 7 for the Macintosh, a cross-platform development tool.

According to the New York company, Jam 7 for the Macintosh lets developers build applications in the Macintosh environment and deploy them on more than 100 platforms and operating environments. The product has a Screen Wizard feature that lets users build database applications without writing code. Jam 7 for Macintosh supports Apple Computer, Inc.'s Scripted Apple Events by providing a custom Event for addressing JYACC's Jam. This lets developers modify any Jam property that can be assigned to screens or controls.

The product also generates objects at runtime. It features flexible grids and integratable tool bars for creating communication graphical interfaces without coding.

► **JYACC**  
(212) 267-7722

**Viasoft, Inc.** has introduced Via/Alliance 1.1, the application-understanding component of its Systems Workbench suite of tools.

According to the Phoenix company, Via/Alliance 1.1 locates hidden relationships buried in source code and lets users perform application impact-analysis tasks in minutes. It provides support for Computer Associates International, Inc.'s Endevor/MVS source management environment and an export facility to Texas Instruments, Inc.'s Composer by IEF application development environment.

Viasoft pricing is based on the processing power of a designated CPU. Pricing for Via/Alliance 1.1 for a Group 50 machine starts at \$60,000. Seat pricing is also available.

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**Business Intelligence** You've heard all the buzzwords (EIS, DSS, OLAP, Intelligent Query, Visualization). But what do they all mean? As a collection of incompatible products, they could mean trouble. But together and fully integrated into a comprehensive decision support environment, they could mean making good business sense out of reams of raw data. We provide them all. And we can design just the right mix for you.

# 3

**Technical and Analytical Tools** Of course, decision making is not unique to the business side. If you have quality issues on the shop floor or need to analyze the results of your market research, we can deliver the industry's richest set of tools for handling virtually any analytical need.

# 5

**Business Solutions** Maybe you're not ready to tackle that system alone. You won't have to. Our professional services staff can help you as much (or as little) as you require. We can train you, sit beside you, or build complete decision-based applications to your specific requirements.

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**Applications Development** If you need to build decision making into customized systems to get a jump on the competition, count on applications development tools ideally suited for decision support. Count on ours. Our iterative approach to rapid applications development can shave months off of your development cycles, and get the right information into the hands of your decision makers faster.



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# Management

Lights.  
Camera!

Access!

## Entertainment giant MCA doesn't fool around when it comes to giving executives the information they need to make more money

By Rochelle Garner

**G**eorge Brenner isn't your typical chief information officer. He is well-heeled, high-style and more fit than his 50 years would suggest. His presence commands attention. Even Brenner's light-alfused office, with its plush cream carpet, Abbott & Costello movie stills and rose-colored paneling, reflects a level of power more often found among Hollywood dealmakers than heads of technology.

But this particular CIO works at MCA, Inc., the \$4.8 billion entertainment giant. MCA, which is 80% owned by The Seagram Company Ltd., has holdings in motion pictures, television, home vid-

eo, book publishing, music recordings, theme parks and retail stores. Like his MCA colleagues, Brenner is in the business of weaving dreams into reality. But instead of working with movies, television or music, he uses information to knit a system that fits executives' business needs like a \$1,000 suit.

**Consider:** Hundreds of MCA's 5,000 PCs and Macintosh computers can reach out and view 260 newspapers, magazines and trade periodicals. Stocks are updated every 20 minutes. Universal Studio's on-line system delivers television to the desktop. MCA's mainframe, six AS/400s, three RS/6000s and 210 Unix Novell, Inc. NetWare and Internet servers reside on a fiber-optic backbone network that handles Token Ring, Apple Computer, Inc.'s AppleTalk and Ethernet.

So MCA executives across the country can call up information anytime, anywhere.

"We can look at MCA's theaters, pay TV, cable TV, home video and merchandising information for any movie, select it and see how we've done by region of the world," Brenner says.

**The result:** A cost analysis that cuts across five business units and compares marketing costs, advertising expenses and revenue on one screen. The benefits are enormous for MCA executives, who aren't particularly inclined to master data queries and manipulation. Slicing complex relationships between expenses and revenue into instantly meaningful pieces is impressive. But even more impressive is the access speed. One blink, and the information is on-screen.

## INSIDER LISTINGS

- Paul Strassmann's revealing indicators, Page 97
- Intelligence files, Page 98
- Calendar, Page 104

## Lights! Camera! Access!

# Welcome to our studio tour of MCA's executive information system



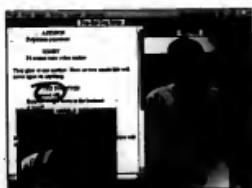
» According to Bremner, the desktop of the future will comprise faxing, videoconferencing, E-mail, video mail, TV and the Internet -- all the better to communicate with.



» Looking for the Internet from Universal Pictures? MCA's World Wide Web site (<http://www.mca.com>), which is on the network without first having to dial up, shows the new trend in electronic advertisements. It gives Universal another way to reach a target market in an advertising-driven business.



» At MCA, it pays to play the show-off game when phoning for next year's budget. Bremner's presentation, written in Microsoft's FrontPage, shows upcoming 15 projects for each of MCA's major divisions.



» The desktop of the future, as envisioned by Bremner, will permit the next mode of communication: video mail. With it, up to four people can sit down at their desktops and discuss, eye to eye, how best should be solved.



» Yes, it's the O.J. Simpson trial on CNN, but it's also Bremner's Macintosh. Thanks to Radius, Inc.'s RadiusView, the software highlights useful news for this kind of content, including up-loading details from the previous day's movie and television sheets on flat executives can monitor progress.



» On one network, executives can call up the mainframe to review sales and inventory expenses, then compare that information against scheduled payables on an AS/400. Both systems are in the Los Angeles data center. An AS/400 in New York, N.Y., reveals manufacturing schedules and costs.

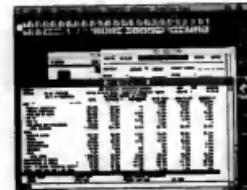


» Bremner's pitch for a new budget gets help from sound, motion and QuickTime movies. Executives from each of MCA's major divisions speak about why they need that next big 16 project. And the process works. "We gotten all the funding I've ever asked for," Bremner says.

His secret? Nearly 5,000 computer screens created to anticipate every conceivable query an executive could want. The screens that make up MCA's Executive Information System are updated nightly by mining various production systems of MCA's business units. The system tracks the multiple facets of MCA's business.

Bremner benefits from his system, too. He receives a nightly report from his Macintosh Duo Dock 250 about his department's previous three shifts across platforms. A daily status report lists help desk calls by type and division. His application development team turns in online weekly progress reports.

"The maintenance and support of client/server is more costly than with legacy systems, but it's worth it in terms of the information it provides our people to run our business in a format they can understand," Bremner says. "The whole point is to give executives the information they need, as quickly as they need it."



» When it's time to make another movie about a costly Saudi terrorist, it pays to know where a previous effort failed. That's what Bremner does. Just pull up the mainframe for that breakdown and compare it to theaters by city, region and date. Then pick up the financials on the AS/400.

Garner is a freelance writer in San Carlos, Calif.

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# PRODUCTIVITY is the measure of success

If you are an information systems professional who wants to build a career with a winning company, here's some advice: Don't judge a company by its size or the ratings that appear in most computer publications.

Many of the large companies that are widely promoted as "leaders in information technology" have slim profit margins. They are shedding employees and cutting back on research and development.

If you doubt this, compare the *Computerworld Premier 100* companies with the Fortune 100 firms. The Premier 100 companies delivered 347% better sales growth and 334% better growth in shareholder equity than the Fortune 100 companies. The Premier 100 companies increased employment by 46.2%, while the Fortune 100 corporations cut jobs.

The following statistics strike down the notion that bigger is better. Last year, the average Fortune 100 company had 24 times more sales, 13 times more shareholder equity and 38 times greater assets, general and administrative expenses than the average Premier 100 company (see chart, "Bigger doesn't mean better").

#### Easy to make mistakes

It's easy for IS professionals to confuse size with success, particularly because most of the computer press makes the same mistake. Unlike the *Computerworld Premier 100* (CW, Oct. 9), which lists corporations in order of their information productivity, computer publications select their Top 100 or 500 lists in ways that inevitably tilt the results in favor of large corporations. (Information productivity is defined as the economic contribution of information management divided by the costs of information management. See our Premer 100 issue to learn how to make this calculation.)

Some computer publications base their rankings on the proposition that bigger is always better. Their valuation scheme ranks excellence based on a firm's 15 budget, the number of LANs or PCs or its client/server population. Other publications rely primarily on consultants and vendors to be judges. Unfortunately what constitutes a "reputation" in business these days is shaped largely by press releases from large corporations.

The statistics I gathered while preparing the Premier 100 list for *Computerworld* show that economic performance, not size or the number of PCs, is a far better indicator of excellence in the use of information technology. That isn't shown by comparing only the Premier 100 with the Fortune 100. Interestingly, even among the best companies, smaller

Paul Strassmann's



#### REVEALING INDICATORS

**Whether you look at sales, equity, R&D investments or employment, the Computerworld Premier 100 companies are growing much faster than Fortune 100 companies**

firms enjoy faster rates of growth and make more productive use of information.

To choose the *Computerworld Premier 100* companies, I examined more than 5,000 U.S. corporations. From those, I picked 504 high-performance firms, defined as those with positive productivity results from 1992 through 1994.

When I grouped the firms by revenue, I found that the 321 companies with revenue of less than \$100 million greatly outpaced the 179 companies with revenue of more than \$1 billion — not just in sales growth but in growth of net income, shareholder equity and employment (see chart, "Leaner but meaner").

#### R&D key

Meanwhile, the small firms managed to maintain a steady stream of investments in future growth, as indicated by the much larger increases in R&D. I find the increased emphasis on innovation noteworthy. The smallest companies were betting on their future by growing their R&D — their knowledge capital — more than three times faster than the largest firms. The smallest firms didn't deliver superior profits by cutting investments. They were investing, not harvesting.

If I were to seek a job today, I would give far more weight to the *Computerworld Premier 100* ratings than those ratings published elsewhere.

However, a word of caution: 83% of jobs in the 5,000 U.S. corporations I examined are still at corporations with revenue in excess of \$1 billion. Just as big banks have more money than small banks, giant firms employ far more people than smaller companies.

The moral of this story is simple: The jobs may be with big companies, but exciting careers most likely will be with firms that keep generating economic growth through productivity gains.

Strassmann has served as chief information officer at major U.S. corporations and the U.S. Department of Defense since 1981. His Internet address is paul@strassmann.com. His World Wide Web address is <http://www.strassmann.com>.

#### Bigger doesn't mean better

*Companies are leaders based on productivity, not revenue*

CW Premier 100 companies			Fortune 100 companies			
1992	1994	% GROWTH	1992	1994	% GROWTH	
Shareholder equity	\$1.63M	\$0.78M	55.7%	\$62.02M	\$78.79M	15.7%
Research & development	\$0.00M	\$0.79M	30.3%	\$21.34M	\$22.99M	-6.0%

#### Leaner but meaner

*The growth rate of CW Premier 100 companies slows with size*

Growth rates of companies	\$1 billion and above	\$1 billion to \$500 million	\$500 million to \$100 million	\$100 million and below
Jobs	15%	33%	35%	20%
Revenue	15%	45%	50%	30%
Shareholder equity	34%	44%	49%	64%
Research & development	23%	54%	60%	73%

## Management

## Intelligence Files

# Damned if you do, damned if you don't

**Mainframe or client/server, IS just can't seem to win when it comes to impressing financial executives**

In the eyes of many financial executives, information systems continues to be little more than a necessary evil, plagued by inefficient systems or minimal returns on investment.

That is the finding of three recent studies on IS performance and returns on investment for those who use mainframe or client/server systems.

In addition, corporate controllers are unhappy with IS spending on mainframe systems.

According to a survey of corporate controllers by the Institute of Management Accountants in Mon-

vile, N.Y., nearly one-third of IS spending still goes to mainframe computers, despite the fact that those systems are considered Stone Age in efficiency.

"We were surprised to find that controllers in midsize to large companies say their systems are 15 years to more than 20 years outdated," says Susan Jayson, director of the institute's Controllers Council.

One controller at a medium-size manufacturing company in the Northeast described his IS department as "an old legacy system run by cowboys."

#### HOW CONTROLLERS VIEW THEIR INFORMATION SYSTEMS

Stone Age – Not up to the job	World-class – Highly efficient
74%	2%

Source: Survey of 2,200 corporate controllers by the Institute of Management Accountants

#### GREATEST OBSTACLES TO ACHIEVING WORLD-CLASS IS STATUS

1. Lack of sufficient staff and time.
2. Budget constraints.
3. No clearly defined enterprise-wide technology strategy.
4. Lack of support from senior management.

Source: Survey of 2,200 corporate controllers by the Institute of Management Accountants

And meanwhile, the view doesn't get much better at companies that are moving to client/server.

Most chief financial officers and chief executive officers say they haven't seen cost savings from implementing a client/server strategy, and the average IS budget decreased slightly this year.

#### HAS CLIENT/SERVER PAID OFF IN SAVINGS?

Have implemented a client/server application	Have seen no cost savings from that implementation
50%	70%

Source: "1995 Information Systems Spending Survey" by Computer Economics

The bottom line, many chief financial executives say, is that IS is a necessary evil. It is an operational expense rather than a strategic investment.

Because of that, most chief financial officers are likely to spend 60% or more of their IS budget on current systems rather than invest in new ones. But they rarely measure financial benefits from IS projects.

#### HOW CFOS VIEW THE VALUE OF IS

Operational necessity	Provides tactical advantage	Provides strategic advantage
43%	30%	27%

Source: Survey of nearly 3,000 CFOs of medium-to-large companies by The Yankee Group and CFO magazine

## Surveys

## New IS priority? Customers

**Customer-focused investments will increase 400% in the next eight years**

A study by Forrester Research, Inc. says the percentage of IS budgets at successful companies used for customer-related investments will skyrocket by the year 2003. The study predicts a dramatic restructuring of investment strategies as a result. It also predicts the Internet will revolutionize business relationships by lowering the cost of transactions, restructuring channels of distribution and eliminating barriers to geographically dispersed markets.



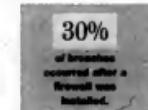
## Internet Security

## Hack-attacks plague the Web

**20% of Internet sites have security breaches**

One in every five Internet sites has suffered a security breach, according to the 1996 Internet Security Survey by the Computer Security Institute in San Francisco, a membership organization for information security professionals. The survey also reports:

20% of Internet sites have been breached



## Associations

## Network, client/server group forms

**Networking, client/server pros who want to network can do so through a new association**

**Interact:** The International Network and Client/Server Association has formed to provide tools, contacts and training for network and client/server professionals.

Interact members may gain access to publications, educational programs and trade shows; a research assistance service; the Interact HelpLine; and a World Wide Web site, Interact/Online.

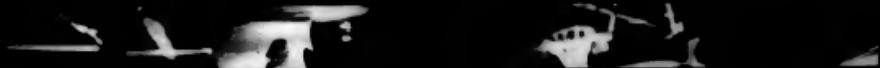
For information contact Interact, 730 E. Chapman Ave., Orange, Calif. 92666, (714) 997-7986 or fax (714) 997-8743.

## Awards

Electronic commerce pioneer Robert Rodin, president and chief executive officer of Marshall Industries, will receive the Annual UCLA Information Systems Associates Award for Executive Leadership.

The award will be presented Oct. 26 at the John E. Anderson Graduate School of Management at UCLA. Rodin will be honored for his "leadership and technology vision" that has led to Marshall's leading position in electronic commerce.

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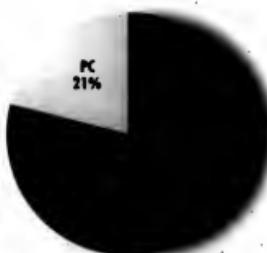
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# HOW DO WE KEEP CO



July 10, 1995  
Editorial Profile



July 17, 1995  
Editorial Profile



August 7, 1995  
Editorial Profile



August 14, 1995  
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## EVERY WEEK WE

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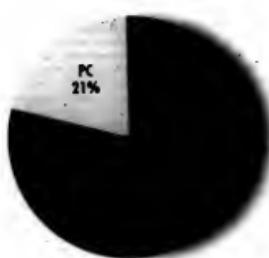
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# COMPUTERWORLD FRESH?



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August 28, 1995  
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The Newspaper of IS

## Management

## Calendar

Oct. 23-Dec. 1

## MANAGEMENT

## Telecommunications '95, Santa Clara, Calif., Nov. 7-10

Topics include: whether telecommunications makes sense for the operation, selecting the right people in telecommunications, supervising telecommuters and keeping them involved and informed, choosing the right technology and making it work, integrating new office designs with telecommunications to realize significant space savings and gaining top management approval and support. Contact: Telecommunications '95, c/o International Call Management Institute, Annapolis, Md. (301) 854-0054.

## Dot-Buster Details, Chicago, Nov. 9-10

Topics include: software, equipment, outsourcing and client/server contracts. Fee \$1,295. Contact: International Computer Negotiations, Winter Park, Fla. (407) 740-0700.

## High Tech Procurement Workshop, Chicago, Nov. 8-10

Topics include: supplier/partner workings,

methods, plays and negotiating gambits. Contact: International Computer Negotiations, Winter Park, Fla. (407) 740-0700.

## Women On-Site Conference, Washington, Nov. 8-10

Topics include: How many women are online, and who are they? the women's market in cyberspace, on-line merchandising strategies and safeguarding transactions on-site. Contact: Young & Associates, Inc., Rockville, Md. (301) 309-6404.

## Achieving Best of Class: Leading, Managing and Coaching the Modern Software Organization, Washington, Nov. 13-15

Topics include: risk management, dynamic modeling, making change possible; process improvement and bus prototyping. Fee: \$1,085. Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 384-6305.

## Communications Managers Association Telecom '95, 20th Annual Conference &amp; Exposition, New York, Nov. 13-16

Topics include: "Strategies for Connectivity." Focus will be on remote access, international technology challenges and issues, network connectivity and managing more with less. Contact: Tolley Management Group, Inc., Woodbury, N.J. (609) 354-2806.

## IT Services '95 Conference &amp; Showcase, Washington, Nov. 13-17

Topics include: software, equipment, outsourcing and client/server contracts. Fee \$1,295. Contact: International Computer Negotiations, Winter Park, Fla. (407) 740-0700.

## Tools &amp; Technology for Self-directed Learning, Scottsdale, Ariz., Nov. 17-19

Topics include: "Innovative, Interactive Training Systems for Boosting Employee Performance." Topics include self-directed learning and teams, self-managed learning and multimodel computer-based learning. Contact: International Quality & Productivity Center, Little Falls, N.J. (201) 254-0211.

## INDUSTRIES

## The Third Color Imaging Conference, Scottsdale, Ariz., Nov. 19-20

Focus will be on creation,

transmission reproduction and display of color images, both traditional and digital. Jointly sponsored by the Society for Information Display and the Society for Image Science & Technology. Contact: Pam Forness, Society for Image Science & Technology, Springfield, Va. (703) 642-3000.

## Council for Electronic Revenue Communications

Advancement — Fall Membership Conference, Arlington, Va., Nov. 9-10

This conference will update electronic revenue communications stakeholders on the latest advancements in the field. Included are updates by the IRS and other government department officials and industry leaders. Contact: Lisa Karsene, Council for Electronic Revenue Communications Advancement, Chicago, Ill. (312) 944-0810.

## Comcast: The Global Event for Computers and Communications in Health Care, Atlanta, Nov. 19-20

Topics include: computers and communications in health care, computer hardware and software systems, communications/networking, electronic bar coding and data interchange. Contact: PAN Communications, Andover, Mass. (978) 474-0055.

## USER GROUPS

## Open Media Framework (OMF) Interchange International Developers Conference, Colorado Springs, Oct. 23-26

Focus will be on digital postproduction process and how consumers can effectively interchange projects by using OMF-compatible products and applications. Contact: Alan Walker, Schwartz Communications, Inc., Wellesley, Mass. (617) 451-0770.

## General Magic Developers Conference, San Jose, Calif., Oct. 29-Nov. 1

An in-depth look at Magic CAP and Teleport platforms and related market opportunities. Fee: \$495. Contact: General Magic, Sunnyvale, Calif. (800) 469-4342, ext. 4273.

## ABU Fall '95 Conference &amp; Exposition, San Jose, Calif., Oct. 29-Nov. 1

— "The New Virtual Enterprise." Targets network managers, administrators, support staff and decision-makers. Keynote by Michael Rothman, program director of global networking strategies at Meta Group, Inc. Contact: Association of Bayesian Users International (ABUI), Chicago, Ill. (312) 844-6610.

## Comptech Users Conference, Florham Park, N.J., Oct. 29-Nov. 1

— Keynote by George Schenck of ECL. Barry Wilder of Meta Group, Inc. and Brian Sommer of Andersen Consulting. Contact: Comptech Software, Inc., Rutherford, N.J. (201) 938-3400.

## Comshare North America Users Conference, Ann Arbor, Mich., Oct. 29-Nov. 1

— "Ideas in Motion." Keynote by Don Tapscott, co-author of *Participate Shift: The New Frontier of Information Technology*. Contact: Comshare, Inc., Ann Arbor, Mich. (800) 469-7561.

## TECHNOLOGY

## Wireless World Expo '95, San Francisco, Nov. 7-9

— "Customer Care: The Great Differentiator." Topics include: shared protocol techniques, wireless LANs, bridges and links, wireless location strategies and tracking the team market. Fee: \$995. Contact: E.J. Krause & Associates, Inc., Bethesda, Md. (301) 962-7800.

## Interactive Entertainment: Games, Gambling

Video & Chat, Washington, Nov. 9-10

Topics include: state-of-the-art interactive entertainment marketplace, interactive entertainment platform, interactive game, interactive gambling and interactive video advertising. Fee: \$695. Contact: RSP Publications, Inc., TR Conference Department, Washington, D.C. (202) 542-8022.

National Conference on Merging Your Organization with the Internet: Successful Implementation, Arlington, Va., Nov. 19-20

Sponsored by the Washington Chapter, Society of

the Internet Professionals and Capital PC User Group. Contact: U.S. Professional Development Institute, Silver Spring, Md. (301) 445-6900.

Power Testers, Orlando, Fla., Nov. 19-21

Focus on ways people are solving length testing problems and concentrating on practice. Contact: Quality Assurance Institute, Orlando, Fla. (407) 353-1121.

Comdex/Fall '95, Las Vegas, Nov. 19-21

Topics include: management strategies, business or

the internet, multimedia, distributed computing,

the changing desktop, network infrastructure,

wireless and mobile computing, technology fundamentals, business process reengineering and outsourcing. Contact: Gold

banks Comdex, Inc., Needham, Mass. (617) 460-6800.

The 9th Annual Open Systems World/FedUnix Conference and Trade Show, Washington, Nov. 19-21

— Conference consists of six major programs, including the Unix Network Security Conference, Open Data Warehousing Conference, Open Client/Server Solutions Conference, Multi-Platform/Interoperability Users Conference, Internet/WWW from Z-A Conference, Linux Interactions: Users & Developers Conference, Creating the Electronic Government Free Conference, Federal Leadership Awards and Taste of SCO Forum. Contact: Jennifer Kinske, Open Systems World, Inc., Columbia, Md. (301) 586-8890.

Faxworld '95, San Francisco, Nov. 29-Dec. 1

Focus is on helping information systems and communications professionals who are utilizing or implementing fax-integrated messaging technologies in their organizations. Keynotes by

Chris Rose, executive editor of *Communications Week*, on "A Vision of an Integrated Communications Strategy" and Mark Skapik, president of Delrina Corp., on "The Future of Fax Software." Fee: \$995. Contact: Customer Service of BIS Strategic Decisions, Norwell, Mass. (800) 873-8992.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

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# The CW Guide to Network Operating Systems

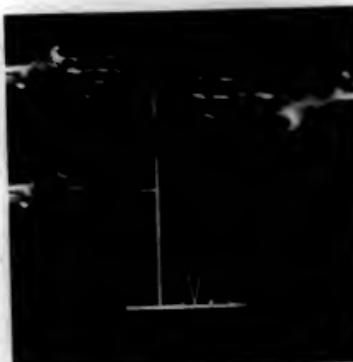
# NOS metamorphosis

New roles emerge for network operating systems; Windows NT, NetWare go head-to-head

**U**nder its traditional definition, a network operating system is the software that connects PCs and manages networked resources so that things will run smoothly. Now you can forget that definition because the networking world is changing every day.

Enterprise network operating systems are evolving beyond the old parameters: They're more scalable; they communicate more easily over multiple protocols; they offer extensive security features because the system handles geographically dispersed networks; they're allegedly more reliable; and they offer — or at least are making an effort to offer — directory services to improve the interoperability of directory services in operating systems and applications.

Further, in a field once dominated by Novell, Inc.'s NetWare, we're seeing Microsoft Corp.'s Windows NT Server make astonishing strides. According to a recent *Computerworld* survey, managers are willing to pay salary premiums for NetWare expertise but will pay even more for NT skills. In a lab test con-



ducted for *Computerworld* by The Tolly Group, NT Server takes the ribbon in most performance categories. Overall, NetWare and NT Server each have strengths, so read carefully and keep in mind which features and functions are important to your environment. See "Pitting NT Server and NetWare to the test," page 106.

In our Buyers' Satisfaction Scorecard, conducted by First Market Research, 50 users of each of the top network operating system products — NetWare, Windows NT, Banyan Systems, Inc.'s Vines and IBM's LAN Server — rated their satisfaction in five critical categories. While overall performance scores for each product

were strong, NT again held an edge in many areas. See page 113.

Computer Intelligence InfoCorp senior analyst Paul Zagneski predicts that global directory services and desktop management technology will have a major impact on future network operating system versions. See *Small Peeks*, page 116.

Finally, because we can always learn from others' experiences, IS managers share how they selected their NOS. See page 116.

## The CW Guide to Network Operating Systems

# Putting NT Server and NetWare to the test

*NT Server and NetWare match up on features and third-party support; NT gains an edge in performance*

By Kevin Tolly, John Curtis and Karl I. Metzelaar

### NOW THE TOLLY GROUP DID IT

Our test evaluated core network operating systems functions, enterprise add-ons and system performance.

For most software users, Novell's considered to be the market leader, but vendors are likely to adjust prices to keep their numbers as competitive as possible. For this comparison, we conducted research, interviews with vendor experts and actual hands-on evaluations of the network operating systems and various third-party add-on products.

#### SERVICES

Dell Computer, Inc.  
Power-Edge 2800-2  
CPU: Dual 90-MHz Pentium  
Memory: 512 bytes  
Bus architecture: PCI, ISA  
Hard drives: Dual 10-Amp SCSI  
Software: NetWare 4.1  
NT Server 3.50 and  
Lotus Notes 3.0 (NetWare and Windows NT versions)

#### CLIENTS

4 Dell Dimension XPS P400  
CPU: 90-MHz Pentium  
Memory: 512 bytes  
Bus architecture: PCI, ISA  
Hard drives: 540MB-4bytes SCSI  
Software: Windows for Workgroups 3.11

#### NETWARE

Network Interface Cards Fast  
Ethernet PCI 10/100Mbps-T  
Concentrator: 3Com Corp.  
FDDI-100 Fast Ethernet  
Connectronics  
Cable: Four-pair UTP

More than a decade after the introduction of Novell, Inc.'s NetWare, many network managers are still trying to decide which network operating system to choose: NetWare or Microsoft Corp.'s NT Server.

By running tests in three key areas — core system functions, enterprise add-ons and performance — The Tolly Group, an information technology testing organization, was able to identify and quantify some areas where clear differences exist.

Our tests indicate that overall it's a toss-up between NetWare and NT in core functionality and availability of enterprise add-ons. But NT's ability to match NetWare in these areas is something of which Microsoft should be proud. In limited performance benchmarking, which included file and application services at a workgroup scale, NT bested NetWare in five of six scenarios, although NetWare was unable to take advantage of our dual-Pentium server like NT did.

This by no means suggests that NT will take over the network operating system market. But it does mean NT has taken its place as a viable alternative to NetWare.

#### TEST NO. 1

##### CORE SYSTEM FUNCTIONS

No surprises here. By now, most of us are familiar with points each vendor touts about its network operating systems. For example, Novell's NetWare Directory Services far surpasses what NT has to offer with its current domain-based management scheme. And, for the moment at least, NetWare seems to have the upper hand on reliability (see related story, page 108).

When it comes to portability and, to a large extent, scalability, NetWare pales in comparison with NT's microkernel approach, which already allows NT to run "natively" on non-Intel Corp. processors. In addition, NT already supports symmetrical multiprocessing (SMP) systems, while Novell only recently announced an SMP strategy based on partnerships with third-party suppliers. The lack of SMP support in NetWare at the time the test was conducted may be one reason why NT outperformed NetWare in our benchmarks.

The internal architectures of the systems are as different as night and day. NetWare offers a purpose-built operating system that doesn't support virtual memory or pre-emptive multitasking. Novell maintains that this type of system is required to deliver good performance.

In stark contrast, NT is a "standard" operating system that uses multitasking and virtual memory to run multiple

tasks simultaneously. Under NetWare, most third-party products — implemented as NetWare Loadable Modules (NLM) — run as privileged processes, have access to the "heart" of the system and could crash the server at any time. With NT, all application programs run in a special "user" mode. If that program goes beyond its bounds, the operating system will terminate it before it causes any harm.

We prefer the standard approach over the proprietary, especially if it seems to perform as well or better than the proprietary alternative. Further, it is no doubt much easier for third-party vendors to hire designers and programmers skilled in the Win32 application programming interface and architecture than it is for them to find experts in building NLMs. In many cases, that vendor already has built a version of the application for Windows NT and/or Windows 95 environments that can become the basis for the server program.

Conclusion: Given the preferences of different network managers, you can call it a draw in core functions.

#### TEST NO. 2

##### ENTERPRISE ADD-ONS

Here we move deeper into the more sophisticated functions of special interest to enterprise environments. We identified a number of key components and looked at products from network operating system vendors and

third-party vendors.

Our goal was twofold: To determine if the offerings for one system far outnumbered the other and to determine if, when using like products, the internal architecture of the system would have any obvious effect on the richness of function. Because of the large number of products and the likely interdependencies that existed, only minimal spot-checking was performed.

The news, on paper at least, is all good. We compiled information on backup, SNA access, virus protection, remote access and uninterrupted power supply systems. And for fun, we threw in a World Wide Web server. Except in the case of the Web server, we found multiple broad-based offerings for each operating environment. The Web server also was the only product area in which we failed to find a NetWare offering.

In many cases, the same vendor offered functionally identical products for NetWare and NT. American Power Conversion's PowerClash software that protects systems during power failures; Cheyenne Software, Inc.'s ImpulseON virus protection software; and Lotus Development Corp.'s Notes groupware software are good examples. As described below, the differences between the NetWare and NT versions are trivial at best.

Conclusion: The choice of base network operating systems doesn't determine or limit the choice among applications and vendors. So again, a toss-up.

## The CW Guide to Network Operating Systems

### PRODUCT PROFILE

NETWARE

WINDOWS NT SERVER

### Other issues to consider:

- NetWare's file and print services appear as a transparent extension of standard client operating environments, which makes it relatively easy to replace NetWare redirectors with equivalent software to access NT Server.
- NT Server requires rebooting for most changes, including network adapter drivers and protocol bindings.
- NT Server requires a full reinstallation to change the domain name.
- NetWare requires a network workstation to perform most server tasks.
- Early SMP support for NetWare will be through authorized resellers only.

### TEST NO. 3

#### SYSTEM PERFORMANCE

NetWare is first and foremost known as a high performer in the realm of traditional file services. NT, on the other hand, is most often thought of as an application server platform that also can deliver traditional file and print services.

For our performance samples, we wanted to make certain that we exercised both types of functionality, although the tests were done on a limited-scale basis using four clients.

One might have expected NetWare to prevail in the file server portion and NT in the application handling. What occurred was a surprise. In an evaluation of file services using standard Microsoft Windows for Workgroups clients, NT completed both the upload and download functions using a 50M-byte file almost twice as quickly as the NetWare server did. The IPX protocol was used for NetWare, the NetBIOS protocol for NT. Score one for NT.

In an evaluation of Notes that combined file and application services by calling for a Notes-controlled database copy, the results were mixed. NT exceeded the outbound copy (from server to client) more than twice as fast as NetWare did. From client to server, however, NetWare finished the job in less than half the time of NT. This was the only scenario in which NetWare won on performance.

This portion of the performance test was a draw.

Finally, we used a server-executed

function, a Notes full-text indexing process, to compare effective application processing speeds. Almost no traffic flew across the network. When indexing a single database or even four queued databases, NT finished first by a significant margin.

It may be that NT's ability to take advantage of the two processors made it a "no contest." Whatever the reason, these samplings of performance indicated that NT is no slacker.

After we conducted this test, Novell announced support of SMP. That feature would likely have resulted in better performance results for Novell. However, even now, they are still months behind NT because only OEMs are offering the SMP support, which may indicate that Novell's "old" architecture is experiencing a difficult evolution.

Further, we ran the performance portion of our evaluation with NT Server 3.50 because hardware incompatibilities during installation prevented us from running Version 3.51 in time for this test. Our Dell Computer Corp. FC suffered from an incompatibility in which the Peripheral Component Interconnect bus would not operate properly when running NT Server 3.51. (Dell is aware of the problem.) Therefore, we used NT Server 3.50 for the performance portion of the evaluation. Microsoft claims that 3.51 offers significant performance improvements over NT3.50.

*Tolly, Curtiss and Metcalfe are affiliated with The Tolly Group, an information technology testing organization in Mahwah, N.J.*

### NetWare 4.1 vs. Windows NT 3.5 performance comparison

*Relative performance of NetWare and NT's version NT 3.50 with fastest time represented as a 10 and the slower score calculated relative to the fastest time*



## The CW Guide to Network Operating Systems

# Piece by Piece

*NetWare and NT define their own areas of strength*

### DIRECTORY SERVICES

NetWare 4.1's NetWare Directory Services (NDS) incorporates a single directory database, which may be replicated, for all resources and all clients. Through centralized directory services, a user, server or application can access another resource on the network independent of that resource's location. NetWare provides customization of network objects among 14 categories.

Microsoft's Windows NT, although often thought of as a departmental network operating system, is also designed for larger networks. Interdomain resources are available only through servers-to-everyone communications via what Microsoft calls "trust relationships," but such domains are in many ways equivalent to Novell's network partitions.

There are important differences between the two approaches. NetWare partitions remain aware of other users' existence, while NT Server domains remain unaware of one another until trust relationships are established. Novell sees automatic partition awareness as an advantage for administration; Microsoft considers domain privacy a security benefit. Another distinction is that NetWare supports multiple partitions within a single server, whereas NT servers can belong only to a single domain.

NT Server is limited in its directory structure because directory objects are either users or devices, while NetWare supports 14 object types. However, both are extensible. Microsoft's Open Directory Services interface, an Open Database Connectivity interface, supports directory services across multiple directories. Novell, through its Novell Directory Assistance Partners, can provide application programming interfaces for extending NDS objects, and a number of third-party developers have already built such APIs.

In summary, organizations whose departments are generally independent and whose management scheme is departmentally autonomous will fare better with NT's domain-based directory scheme; organizations requiring a single, central point of management for the enterprise will fare far better with NDS.

### FAULT TOLERANCE

NT Server is built around a microkernel architecture and provides a level of protection for the operating system. NetWare's Netware Loadable Modules — both those provided in the operating system and in third-party applications — operate in Ring 0, the level at which processes are most tightly integrated with the operating system, and Novell continues to maintain a list of NetWare 4.1-compatible applications. Such applications must support an optional protected domain operation in which the user can specify operations in Ring 3 to prevent any disruption to server operation. However, operation in Ring 3 yields lower performance and, Novell would contend, is one reason protected operation can reduce server performance on any platform.

Another important consideration is the operation of the network during server/controller fail-

ure. If a primary controller in an NT server fails, promoting the secondary controller to the role of primary controller requires manual intervention. While this isn't a lengthy process, it does require the availability of the network administrator. In NetWare 4.1, by contrast, the activation of a backup server is automatic.

### SECURITY

NetWare 4.1 includes several security features. NetWare 4.x's NDSS uses RSA Data Security, Inc.'s public encryption key technology. NetWare Core Protocol uses packet signatures to prevent packet forgery. NetWare is currently under application for the so-called Red Book certification with the National Computer Security Center.

NT offers no packet signature security. However, it does use Challenge Handshake Authentication Protocol during log-in to prevent passwords from traversing the network. NetWare sends passwords across the network, albeit in encrypted format. Contrary to previous reports, Microsoft has applied for both Orange Book and Red Book C-2 certification. The former has been issued and the latter is under way. However, this certification applies only to NT Server and NT Workstation and therefore doesn't apply to other client platforms such as DOS or Windows. Novell's certification, on the other hand, applies to the overall architecture and is therefore more comprehensive.

Microsoft's NT Server documentation suggests not setting a password for some network services. However, following this advice will mean that unscrupulous users could access these unsecured processes. During discussions with The Toly Group, Microsoft suggested that security-conscious network administrators set these passwords to prevent disruption of network activity.

### CLIENT CONNECTIVITY

Both NetWare and NT Server support DOS, Macintosh, OS/2, Windows for Workgroups and Windows NT clients. NetWare also supports Unix clients. For peer-to-peer networking, NetWare provides Personal NetWare, while NT Server supports Windows for Workgroups and Windows 95. — *The Toly Group*

## Vendor response

Microsoft told *Computerworld* that Novell's security certification will be less comprehensive because it is based only on network-oriented NetWare functions and a single third-party client. It also said NT is designed "to be as secure as you want it to be."

Novell officials questioned the performance tests, noting that NetWare typically outperforms NT in file services. Novell told *Computerworld* that NT should have been tested on a single-processor system and suggested that the use of any cache on the client systems could unfairly favor NT.

## SNIPPETS

A sampling of comments from technical reviews of network operating systems.

"NetWare 4.1 has the strongest security and managing integration. Reliability is good, although application services are only fair. Novell's biggest advantage may be the user databases, which results in strong third-party support. LAN Server 4.0 has the most powerful application services, but its directory services are weak. Systech's Vines is known for its powerful directory services and is good in most other areas.... NT Server, which has good application services, is emerging as the platform of choice for many single-MES enterprises." — *Byte Communications*, May 21, 1995

"LAN Server 4.0 is up to par with the leading network operating systems in almost all categories of importance. The major drawback to this release of LAN Server is that it still lacks a global naming system, such as Systech's StreetTalk or Novell's NDS. But Systech has backed up LAN Server's domain support, so you can build large, multiuser networks. — *LAN Magazine*, March 1995



LAN Server scores well in categories such as administration

"Chief among Systech's enhancements to Vines 4.0 are generalized log-in through StreetTalk clustering, highly leveraged distributed Simple Network Management Protocol Version 2 support, increased likelihood of not great load-balancing systems and a configurable kernel." — *PC Week*, June 26, 1995

"Installation and configuration was a clear win for Microsoft Windows NT Server.... Among its greatest strengths is its ability to auto-detect and then appropriately configure itself for whatever peripherals, adapters and controllers are installed in the PC server. Another plus for NT Server includes support for symmetric multiprocessing." — *Computerworld West*, June 19, 1995

"The differences between NetWare 3.2 and NetWare 4.1, [NetWare Directory Services] is the one that matters. If you need easier network administration, NetWare is an X.500-like, global, distributed directory service.... But NetWare is not simple. Creating an optimal directory structure for a large, worldwide network will require extensive planning and practice." — *PC Week*, May 29, 1995

"Evolutionary is the best way to describe Vines 4.0.... The package is infused with enough new features that current Vines shops should consider the upgrade. Organizations not ready to abandon their current operating system but looking for directory services to decrease administrative overhead may want to investigate Systech's Enterprise Network Services." — *PC Week*, June 26, 1995

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## The CW Guide to Network Operating Systems

# NOS NOTES

*Information to help you make buying decisions*

### GLOSSARY

**Network operating system** — A multiuser operating system that manages network resources. It manages multiple requests concurrently and provides the necessary security.

**Enterprise network operating system** — Software that provides the means for sharing resources over a geographically dispersed network; one organization.

**Client/server** — The architecture around which network operating software is designed. A portion of the network operating system resides in each client machine and server. The client portion handles client requests for data; the server portion handles processing and the I/O to clients, other servers or shared network devices, such as printers, fax machines and modems.

**Connectivity** — The ability of a network operating system to simultaneously communicate over multiple protocols.

**Resource sharing** — The ability of users to share all resources, such as printers, modems, applications and files.

Sources: Paul Zagorski, Computer Intelligence Inc./Corp.; *Understanding Local Area Networks* by Stan Schatt, SAMS Publishing, 1989; *The Computer Glossary*, Seventh Edition, by Alan Freedman, The Computer Language Co., 1995.

### QUOTES

IS managers who have recently purchased or upgraded their network operating systems had the following comments:

"At the time we did the evaluation, we chose NetWare for the enterprise. The three major reasons were NDS, tools that allowed us to centrally manage a worldwide network and because it was a cost-effective solution. Other reasons were the security functionality and the abundance of application providers." — Paul Schuler, director of server technology at The Mead Corp., in Dayton, Ohio

"We decided to switch from Novell, so we considered Sun, Digital, IBM AIX, Microsoft Windows NT Server and other Unix operating systems. We needed additional services and wanted to be cross-platform using TCP/IP. Microsoft Windows NT Server came out on top because it was a cost-effective solution. Also, it provided ease of management and worked with our hardware." — Michael Aday, manager of research and development at Quad/Graphics, Inc., in Pewaukee, Wis.

"OS/2 is easy to install and it doesn't crash. We use Windows NT Server for some Web servers and they crash frequently. AIX and OS/2 are more reliable." — Jim Flannery, wide-area network systems engineer at MCI Telecommunications Corp. in Englewood, Colo.

"There is no such thing as a single vendor anymore. The important thing is interoperability. Banyan has always done this well." — Tim Gilkerson, director of global network operations, The Gallup Organization in Lincoln, Neb.

"Determine the size of your network, the number of users and the types of applications. Pick a system that allows you to work now and grow in the future. Also, your protocol method, wiring scheme and method of communications should all be considerations." — Michael Swearingen, lead software analyst at Lee Apparel Co.

## Sneak Peek

By Paul Zagorski

### Network operating system outlook 1: From global directory services

The great thing about networks is that users can access data and resources anywhere in the enterprise (or the world, via the Internet). The lesser thing about networks is that you can't find what you want.

A global directory service can provide a live list of network-related things — such as computers, printers, servers, applications and documents — and a list of users, buildings and computer devices such as video projectors — anything users might need to know about circuits.

It's inefficient, for example, to maintain separate enterprise directories for file servers (which list servers, disk directories and documents), electronic-mail systems, human resources databases and applications such as shared calendars. These directories all share some common information but can't be managed as a common resource.

Microsoft, Novell, Banyan and others have proposed various flavors of global directory services intended to act as a "table of contents" for corporate and/or public networks. These schemes and/or products are based on the X.500 standard for directory services. They are in the market now or are about to be introduced, and will be key to advancing the usefulness of enterprise and inter-enterprise global networks.

Banyan has even floated the idea of creating a global directory service for the Internet, with hundreds of millions of data elements. Intriguing, but is it practical?

### Network operating system outlook 2: Building better desktop environments

A continuing theme in client/server computing is that desktop computing systems, based primarily on control by individual users, can't reliably hold their own against the administrator of structures. They crash, their hard drives lose data, and they even disappear from the network (Windows' portable).

To create more robust management for desktop systems, some vendors have resorted to the Desktop Management Task Force (DMTF), whose main goal is to create the Desktop Management Interface (DMI), a set of standards for monitoring and managing desktop computers.

This effort has affected hardware and software system design, network operating systems, management applications and even the philosophy of independent PCs vs. centrally controlled interaction systems. Most DMI tools want better control of desktop "agents," but is what good?

When the rumors began that Windows 95 combination software would collect data from the PC on which it was being installed and report it back to Microsoft, angry users suggested that Big Brother was descending on the world of personal computing. The DMTF isn't going to polarize attitudes about personal vs. organizational computing if it creates a scheme to manage the components of client/server systems.

Zagorski is a senior analyst at Computer Intelligence Inc. in Boston.

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  - DOS/OS2 (iii) Windows 95
  - UNIX (iv) Linux
  - AppleTalk (v) NetWare
  - IBM Development Products (vi) Yes (vii) No
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## The CW Guide to Network Operating Systems

# Buyers' Scorecard: NT Server takes lead

By Kevin Burden

**M**icrosoft Corp.'s Windows NT Server doesn't have the same market seasoning or as many revisions as Novell, Inc.'s NetWare, Banyan Systems, Inc.'s Vines or IBM's LAN Server, but that didn't stop NT from becoming the darling in this Buyers' Scorecard.

In three out of five categories — performance, reliability and systems management — more NT Server users gave ratings of "good" or "very good" than any of its competitors. In the directory services category, NT was barely beaten by the StreetTalk directory in Banyan's Vines.

Computerworld hired First Market Research to ask 50 users of each of the top network operating systems to rate their satisfaction in 28 categories. The review is based on the five categories historically critical to network operating systems.

Ease of use partially explains NT Server's success, according to Rob Enderle, senior analyst at Dataquest, Inc. in San Jose, Calif. NT Server is every bit as powerful as NetWare, Vines and LAN Server, he says, but NT has exceptional on-line help, a directory structure that lets administrators organize environments into logical groups and one of the best client-to-server interfaces for Windows NT Workstation clients.

"NT [Server's] approach to common functionality may differ from the others," says Enderle, referring to NT's domain directory and data replication features. "But it's easy to learn and use, and that helps at installing users."

Overall performance scores for the four network operating systems are strong, reflecting satisfaction with overall functionality. NT holds a slight edge when combining the "good" and "very good" responses. LAN Server comes in second in overall performance, followed by Vines and NetWare.

### Directory services

Banyan's strong directory services got only strong in Releases 5.5 and 6.0; 30% of Banyan's users gave favorable grades to StreetTalk III, with many saying it's the easiest directory to understand and manage.

NT Server's Domain Naming Service had the second-highest number of users awarding favorable grades. NT's domain approach differs from the hierarchically organized directories that Banyan and Novell use in that it lets managers group users and re-

sources into logical domains. Its drawback is that each domain needs to be managed individually through the network's primary domain controller, which can make administration tedious, according to users.

IBM's LAN Server also uses a domain directory that 65% of its users approved. While that shows respectable user support, it doesn't match the enthusiastic backing Microsoft received.

In a related question on directory design, Novell's hierarchical approach received favorable grades from 62% of NetWare users. But while Banyan users were nearly 20% higher for overall directory services, several Novell users said the tools for making changes were much improved in NetWare 4.1.

### Reliability

Nearly the same number of users gave each system favorable ratings for reliability. IBM, Microsoft and Banyan each had more than 70% of its users giving favorable grades, and NetWare had just over 60%. More than half of the 60% gave NetWare "very good" grades.

All of the systems support some form of replication in which databases or entire servers are mirrored while one goes down.

NetWare automatically copies the NetWare Directory Services database to back up servers during installation, and it synchronizes mirrored servers for redundancy.

Replication is new in Banyan's Vines 6.0. Users with 8.0 said it works well, but shadowing is only possible between Vines 6.0 servers and not Vines 5.5 servers.

Several NT Server users focused on NT's reliability as an application server. NT's 32-bit pre-emptive multitasking, multi-threaded, multiprocessor environments makes it "the most reliable server for running applications," one user said.

### Systems management

NT Server users again put Microsoft ahead of its competition — this time way ahead. Its strengths, according to users, is its alerting and troubleshooting. Simple Network Management Protocol agent implementation and the ability to centrally manage multiple servers. Although the utilities for some of the management functions ship separately in the NT Server Resource Kit, users didn't say that was a problem.

IBM, Banyan and Novell finished nearly equal in the systems management ratings, although LAN Server held a slight edge in the number of users giving "very good" scores. The three were just as equal in ease of administration, in which all had slightly more than half its users giving favorable scores.

LAN Server users giving high grades said its domain goes halfway toward simplifying management. "You don't need to crowd the screen with information you don't need," one user said.

Several Novell users pointed to NetWare's NWADMIN interface, a menu feature in NetWare 4.1, as one of its best strengths in this category. The interface lets administrators change network parameters through simple drag-and-drop commands. Other users said they would have given higher scores if Novell bundled ManageWise, its management software suite.

### Support, cost idiosyncrasies

In this scorecard, all four vendors received mediocre scores when averaging user support categories, but each had its bright spots. Microsoft scored well for its response to general inquiries but was dismal at emergency response. Versatility is Banyan's strength. IBM's emergency response was above all others, and Novell's best users were in its support staff's hands.

The word on costs is that acquisition is double, but maintenance costs are only favorable. Ratings for maintenance cost satisfaction averaged 12% lower than ratings for purchase price.



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### USERS' EVALUATIONS

500 users rated their network operating systems. Ranks are listed in order of total favorable ratings. Percentages are based on the responses of 50 users per vendor.

#### OVERALL PERFORMANCE

	Good	Very good
Microsoft	52%	26%
IBM	46%	27%
Banyan	55%	16%
Novell	38%	22%

#### DIRECTORY SERVICES

	Good	Very good
Banyan	43%	37%
Microsoft	44%	34%
IBM	46%	19%
Novell	42%	20%

#### OVERALL RELIABILITY

	Good	Very good
Microsoft	30%	46%
Banyan	33%	41%
IBM	42%	29%
Novell	25%	36%

#### SYSTEMS MANAGEMENT

	Good	Very good
Microsoft	36%	34%
Banyan	33%	16%
Novell	35%	16%
IBM	29%	21%

#### SERVICE AND SUPPORT

500 users rated their support categories.

	Good	Very good
IBM	18%	15%
Banyan	17%	12%
Novell	12%	11%
Microsoft	17%	6%

Burden is Computerworld's senior researcher, Firing Line/Scorecard.

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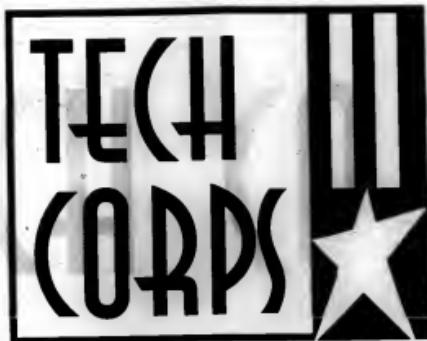
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Issue Date	Ad Closing Color* B&W	Editorial Features & Custom Publications	Show Distribution II 1st Leadership Study Issues
Rev. Sept. 27		<b>Computerworld Client/Server Journal</b> Vertical Market Focus: Brokerage Section Feature: Product Focus on Development Tools	Comdex Fall Client/Server World DB Expo Harvey Study
Rev. Oct. 20	Oct. 27	<b>CW Guide To: Object-oriented DBMS and Development Tools</b> Is object-oriented the next wave in DBMS or is it an embedded technology that will gradually simply add functionality to present offerings? This question and how it affects IS buying decisions will be examined. <b>Buyers' Satisfaction Scorecard:</b> Market leading object-oriented DBMS <b>Firing Line:</b> Latest object-oriented DBMS from a leading vendor	Search Study
Rev. Oct. 27	Oct. 3	<b>CW Guide To: Desktop PCs</b> Pentium, PowerPC and other platforms will be examined with regard to the migration issues and performance gains they provide. <b>Buyers' Satisfaction Scorecard:</b> Market leading desktop PCs <b>Firing Line:</b> Latest desktop PC from a leading vendor	Comdex Fall Las Vegas 11/13 - 11/17
Rev. Oct. 3	Oct. 10	<b>Special Report: Electronic Commerce</b>	
Rev. Oct. 18	Oct. 17	<b>Closer Look: Internet Browsers</b>	Mobile World Boston 11/28 - 11/30
Rev. Oct. 17	Oct. 22	<b>Closer Look: Visual Development Tools</b>	Client/Server World Chicago, 12/5 - 12/7 DB Expo New York City, 12/5 - 12/7 Search Study
Rev. Oct. 22	Oct. 1	<b>CW Guide To: Messaging Software and E-mail</b> With e-mail going through a major architectural change to client/server, the market will have a very different shape. IS should be able to purchase products that better address company needs. <b>Buyers' Satisfaction Scorecard:</b> Market leading e-mail software <b>Firing Line:</b> Latest e-mail package from a leading vendor	
Rev. Oct. 1	Oct. 8	<b>Closer Look: Contact Management Tools</b>	
Rev. Oct. 8	Oct. 1	<b>Annual Forecast Issue:</b> Choices abound for IS managers in 1996, but the budget and the workday will stretch only so far. Computerworld will draw on Computerworld will draw on the expertise of users and industry figures to help the IS manager solve the mystery of where to invest in 1996. <b>Special Section:</b> Jobs Preview 1996	
Rev. Oct. 15	Oct. 29	<b>Closer Look: Storage Management</b>	
Rev. Oct. 29	Oct. 5	<b>Buyers Guide to Notebook Computers:</b> A look at technology directions in portable computers, tips for evaluating notebooks and an analysis of the strengths and weaknesses of leading notebook product lines.	Search Study
Rev. Oct. 22	Oct. 5	<b>Special Report: The Best Computer Science and IS Schools</b>	
Rev. Oct. 29	Oct. 12	<b>Buyers Guide to Network Management:</b> How do today's network management packages meet corporate needs, and how will those products and corporate requirements evolve in tomorrow's distributed computing environment? What features should buyers look for, and how do products compare with each other?	ComNet Washington, DC 1/30 - 2/1

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For Conference information and registration, visit the Tech Corps web site at <http://ustc.org>.

LOVE IT

c/c++

HATE IT

# In Depth



## I love its portability

By David M. Baer

**A**nyone who would try to convince you that C/C++ is not good for developing business applications is a fool.

To begin with, as business application software is moved off the mainframe and onto desktop and open system processors, you're going to have a difficult time avoiding C. Like it or not, in this milieu, C is the lingua franca.

This is an important point: As the common language, C has been forced down a path of rigid standardization. It's enormously consistent and portable across the entire spectrum of computing environments. Try to name even one computer processor of any significance that

doesn't have a C compiler available. You can't. End of story.

As the natural successor to C, C++ has inherited this legacy and is clearly a principal language of the future. Even without making use of its object-oriented capabilities, C++ is a powerful and positive improvement on C. It's more effective and less prone to error.

How is that? While some regard C's loose data-type matching requirements as freedom, others see them as anarchy. C++'s new coding rules, called type-safe rules, put more requirements on the coder and thereby greatly reduce the possibility of error.

*Love H., page 118*

**Do you think C/C++ makes sense for developing business applications? We found one IS pro who can't decide whether he thinks C/C++ is a great marvel or the most unabashedly horrible technology he has ever encountered.**

**We just hope he doesn't come to blows with himself.**



## I hate its complexity

By David M. Baer

**A**nyone who would suggest C/C++ for business application development is an idiot:

Just because we're moving our applications off mainframes to open systems and PC platforms doesn't mean we have to ignore the default technology of these environments.

Use C or C++? Thank you, but I'd prefer my staff to be using modern, programmer-friendly development tools.

Even overlooking C's lack of native

data types for text character strings and decimal numerics (by far the two most prevalent kinds of business data), there's a fundamental problem with the language: So much of C's coding is pointer-based that it can't even really be called a high-level language. Having pointers in your face all day makes it difficult to produce error-free code, even if you're a superior programmer.

You might be able to produce the most *Hate H., page 118*

© Baer, who has never been diagnosed with a split personality disorder, is director of technology at Tenera, Inc., an applications software and services firm in San Francisco. He admits to a love/hate relationship with C++. He can be reached via CompuServe at 716042.1427.

## CONTINUED FROM PAGE 117

Of course, with objects (which I'll get to in more detail later), we also have standard data types, such as text character strings, filling a few gaps in C's repertoire. All thus, and we've sacrificed neither the blazing execution of compiled C code nor C's unmatched ability to interface with the operating environment.

What does this technology mean to your firm? Well, for starters, you have a huge skill pool to draw upon to staff your development efforts because nearly all computer science graduates know C. You're not stuck foot-in-the-door for training them in the latest language fad.

Next, by using C/C++, you have a development capability suitable for just about any kind of project. Are you tackling client/server? Modeling? Database applications? Distributed processing? Number-crunching analysis? You name it, C/C++ can be used to do it. Just try to do graphical user interface coding in Cobol or heavy-duty computations in Microsoft Corp.'s Visual Basic or Powersoft Corp.'s PowerBuilder. Good luck!

But that's not all. There is a wonderful set of support tools available to use in C and C++ development: language-aware editors, code formatters, debugging tools, standards-compliance aids and so forth.

And I haven't even started talking about real power—that is, about object-oriented development. It's no accident that C++ is widely used for object-oriented development and that it has the lion's share of third-party library support. C++ has it all: great features such as operator overloading and multiple inheritance and templates—the works.

There are those who complain that C++ is too complex. Well, I've got two points to make in response. First of all, it takes more than a simple tool to handle a com-



# LOVE IT

# -C/C++

## CONTINUED FROM PAGE 117

plex project. For instance, you've probably got some Visual Basic development going on in which your programmers are using third-party components. Now those components can be quite complex to build, but you can't tell me you're not getting great mileage out of them. Your programmers don't need to understand how these tools are built to use them effectively.

Maybe it helps to think of C++ classes as components, offering the same productivity benefits. So, just buy a few good libraries, use them and get on with it.

Unlike the Visual Basic component, however, the object classes to work exactly the way you want them to. The other response to the complexity issue is that, upon first encountering object-oriented development disciplines, you will inevitably struggle to understand how to use this new programming model effectively. It's easy to blame the language, but face it—getting up to speed on object development is a challenge no matter what programming vehicle you use.

That challenge will be minimized with C++, given its wonderfully rich set of texts and training materials. Of course you could just ignore object-oriented technology, stick your head in the sand and hope you reach retirement before a pink slip reaches your desk.

Assuming you've gotten the message that object orientation is here to stay, then what's your best option? Some convoluted mishmash of legacy technology augmented by trendy, proprietary tools? No way. C++ is already well established and has the momentum to carry it much further. C++ developers are doing some of the most inspired software engineering today.

Your business simply can't ignore this important technology. In today's competitive environment, it's essential to use the best tool for the job. ■



can find these days is Micro Focus, Inc.'s Cobol. How wonderfully convenient, then, that Cobol is the language in which most of our business application specialists are already trained.

That quality is particularly relevant when you consider the issues of bringing object-oriented technology into the world of business software production. Object-oriented Cobol is becoming available, and it's got the full weight of an ANSI-standard specification behind it.

C++ may be an improvement on C, but there's still too much C at the heart of it. The plethora of pointers isn't even the real problem; the real problem is the level at which classes are defined and at which objects function. In C++, the ability to define objects so you can use them in arithmetic and I/O statements is the principal reason this technology is so forbidding.

Clever? Of course. Even fascinating. But is this sort of thing appropriate or even needed for business objects such as accounts, schedules or customers? Hardly. Business objects don't need all of C++'s capabilities.

The cost of those capabilities is an enormous complexity in the language. And there's a good chance that complexity will turn around and bite you when you get into C++ for programming for real. Sure, there are plenty of C programmers running around who claim to know C++, but when it comes to the details of writing C++ classes, it gets to be rocket science fast. See how quickly your C++ "stars" disappear?

By contrast, the object model used in object Cobol is not only a good fit for business problems; it also allows a far clearer, understandable language specification.

Given that it's probably much closer to where you are now in knowledge and skill than any other option, it's the tool that's your best bet for success. ■

And in the area of client/server, add to the list Powersoft Corp.'s PowerBuilder and Gupta Corp.'s SQL Windows. I can take any one of these, and my team's going to finish so far in front of the one trying to use C or C++ that it won't even be a contest. These tools were built with rapid-prototypal user interface (GUI) development in mind, which is certainly not the case with C or C++.

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# Computer Careers

## SWAT TEAMS: Life on the edge

*You'll deal with risks and changes, but you can learn and get ahead*

By Linda Wilson

Pamela Morn graduated from college in 1992. Since then, she has become proficient in Notes, learned a bit about Oracle and been promoted from programmer to project manager.

What's her secret? Though career success usually can't be attributed to one factor, a bit of Morn's upward mobility is probably a result of being a member of a high-profile SWAT team at Texas Instruments, Inc. in Dallas.

SWAT teams, or expert teams as they're sometimes called, are a fairly recent phenomena in the information systems world. They rose out of the need to effectively handle client/server projects. The basic idea is to attack development projects with a crack team of the best and brightest experts in the latest technology. A team is assembled with each project. The teams are small — about five members — or are made up of a series of small subteams for a large project.

The idea is to pool the talents of people with specialized skills developed because IT shops found that generalists, who can't possibly keep abreast of every technology, aren't suited to handle complex client/server projects. "To do client/server well, [it] takes extraordinary knowledge and skills — much more than the normal mainframe skills," says Doug Aldrich, the officer in charge of strategic information technology practice at A.T. Kearney, Inc., a consultancy in Chicago.

Following the theory that two heads are better than one, the team environment magnifies the creative power of individual experts, allowing them to craft better solutions as a group than they would individually.

SWAT teams have another advantage in the eyes of IT management: They enforce technology standards. "You need to have standards, and that is difficult to do in decentralized organizations. You can't just make proclamations and have them

stick," says Wayne Eckerson, editor in chief of "Open Information Systems," a newsletter published by the Patricia Seydel Group in Boston. He says it's much more effective to send out a crack team of experts that will develop projects according to corporate standards.

### On the plus side

Participation on SWAT teams has several advantages. Being a member of a team allows you to learn the latest, hottest technology. By assimilating the knowledge of several people, you'll probably learn more about a given technology than you'd figure out working alone.

And if you manage your career right, you will master a new technology with each team. "Technology moves so fast that you have to be continually building your repertoire of skills, otherwise you are going to be last year's news," Eckerson says.

Mora agrees that SWAT teams are a learning experience. For the past five months, she has been a member of a five-person team devoted to rolling out 11 Notes applications. She says she expects the team, which is in the midst of deploying the applications, to disband as She will then join another team as a project manager.

SWAT teams also foster cross-training. Because some of the applications Morn's team worked on required a structured database in addition to Notes, Mora learned a bit about relational database management systems when the team decided to use Oracle, a relational database product from Oracle Corp. in Redwood Shores, Calif.

Depending on the scope of the project, team members may learn more than just technology skills. If a technology project is part of a broad re-engineering effort, team members learn about business-process analysis, operations management and change management. This happens even more if a SWAT team comprises technology people and businesspeople. "It's an exposure to how the busi-

ness really works, which makes you a valuable commodity. It is like getting an MBA in your business," Aldrich says.

SWAT team members also hone their people skills. Anita Landis, a systems analyst at Lockheed Martin Corp., says she learned valuable skills as a team member. "You have to learn to speak up and that it's OK to say no. And you have to learn to compromise," says Landis, who works at the company's Valley Forge, Pa., office.

Because the teams tend to be high-profile, being a member of a successful one can help your career. Take for example Paul Pelete, vice president of distributed computing and telecommunications at Lockheed Martin Missile and Space.

Pelete joined his first team in the late 1980s when he worked at GE Aerospace, which merged with Martin Marietta in April 1993. Pelete, an advocate of SWAT teams, now manages 30 teams at Lockheed Martin. "Certainly, people grow faster through interaction with other people," he says. "People become leaders [because] they have to lead with people."

### The downside

Joining a SWAT team isn't without risks, however. Indeed, the advantages of working on a SWAT team can also be its disadvantages. How you weigh the advantages and disadvantages will probably reflect your personality and outlook. If you're uncomfortable in unstructured environments, you might not be happy on a SWAT team. A SWAT team, like any team, is much more fluid than a hierarchical department because there aren't clearly defined rules or strict lines of authority. Teams reflect the individual personalities involved.

The somewhat chaotic nature of the team is worse at the beginning. For example, Landis was a member of a team that worked on a cost-management team for four years. She recently joined a new team to develop an accounts payable system. Because she and her former teammates worked together for so many years, they learned to trust and understand one another, and the team evolved into a highly productive unit. With the new team, Landis must start over.

Of course, a bigger downside is the risk

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#### MINUSES

- Must adapt to field situations with lack of rules and structure
- Must adapt to risk-taking environment, bold thinking
- If team doesn't work, project could fail

that team members simply won't be able to work together. "It's difficult to find the right mixture of people who happen to mesh and click," Landis says.

There are several other reasons why teams and projects fail. The project might be based on unworkable technology or processes that simply don't make sense for the business involved.

Whatever the reason, being associated with a failure hurts. "That failure will be pasted on your head as a scarlet 'A,'" Aldrich says. Because SWAT teams tend to work on risky, high-profile projects, the odds and costs of failure are somewhat higher than on run-of-the-mill assignments. Despite the risks, SWAT teams often craft successful projects.

Just as being part of a failure can bring the scarlet 'A,' being part of a success is rewarding and good for your career.



"People become leaders [because] they have to learn to deal with people."

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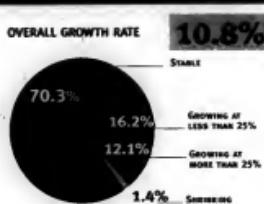
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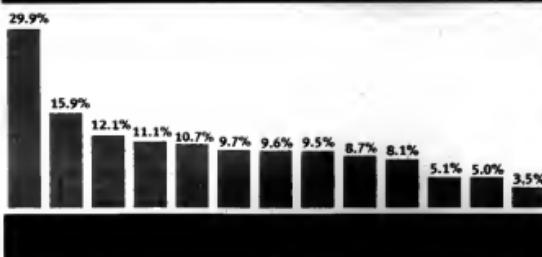


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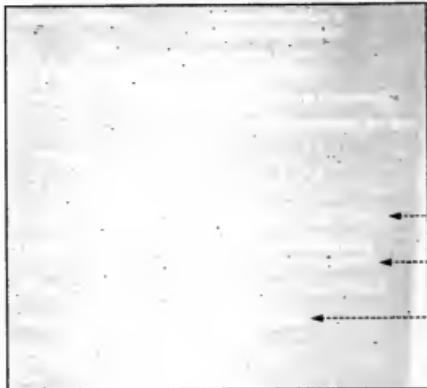
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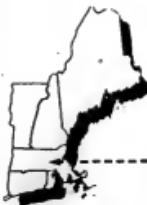
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Sure, there are new skills entering the market every day, but what are the top 10 trends you should really keep an eye on?

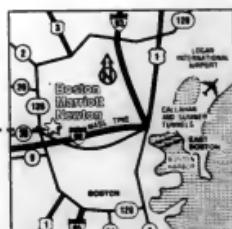
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# Marketplace

## Painful realities for peer-to-peer

**Low-end network vendors must find new opportunities as operating systems take over their old roles**

By Daniel Lyons

The market outlook for peer-to-peer networking is every bit as bright and promising as that of the manual typewriter and rotary telephone — at least that's the prognosis from some pundits who say the client/server paradigm eventually will exterminate peer-to-peer networks.

Adding to the woes of peer-to-peer networking companies is the fact that big players such as IBM and Microsoft Corp. have begun building peer-to-peer functionality into their operating systems.

"The existing peer-to-peer companies are definitely being impacted by the client/server paradigm, and Windows 95 represents the beginning of the final throes of a process that is inevitable," says Brad Day, director of client/server computing research at Dataquest, Inc., a market research firm in San Jose, Calif.

For evidence of the trend, consider that sales at Artisoft, Inc., a leading peer-to-peer vendor, declined 25% from 1994 to 1995 and that the company posted a loss of \$5.8 million during that period. Or note that several vendors have gone out of business.

However, hope springs eternal, and some say reports of the demise of peer-to-peer networking are premature. One peer-to-peer proponent is Frank Berk, chief executive officer and founder of Moses Computers, Inc., one of the first compa-

nies to enter the peer-to-peer market and one of the survivors. "Windows 95 is creating the biggest opportunity for us that I've ever seen," he says.

Berk's theory is that the introduction of yet another operating system adds to the confusion in the market. He says Microsoft's Windows 95 creates more need for products that can connect machines running disparate operating systems. "We'll take the seams in the market, the seams between the different machines," Berk says. "That's big business. The peer-to-peer market is alive and growing, and it's going to get bigger."

Similarly, the people at Artisoft say they simply need to stay ahead of big players, such as Microsoft, by offering more features and better performance. They say the peer functionality in Windows 95 is limited in some ways. For example, Windows 95 users can't access resources on DOS machines on a peer network. But LANTastic, Artisoft's peer-to-peer network operating system, will allow that kind of sharing.

"Until Windows 95 is used on the majority of PC nodes, we're going to have that advantage," says Ken Kark, product line manager at Artisoft in Tucson, Ariz. "And by the time Windows 95 becomes the majority of what's on the network, we will have become much more robust and will have created other ways to differentiate our product."

Lyons is a freelance writer in Ann Arbor, Mich.



### Peer-to-peer networks

#### Leading peer-to-peer networking products

##### LANTastic 6.0

**Price:** \$199 per node; five-user pack costs \$499.

**Snapshot:** LANTastic is the latest in a long line of peer-to-peer products from Moses Computers, Inc., one of the first companies in this market. MosesWin is Windows-oriented, compared with its predecessor, MosesLAN, which was DOS-oriented. MosesWin comes with cabling and network interface cards, key differentiators.

**Moses Computers, Inc.**  
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##### MosesWin

**Price:** Two nodes for \$299.

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spike and has broadened its product line over the years. Today, the company's chief differentiator is that its software can be purchased in bundles with cards and cables. The company plans to add high-performance hardware such as 100-Mbit/sec. network interface cards to its product lineup soon.

**Inventive Software, Inc.**

Foster City, Calif.

(800) 972-2962

**Windows 95**

**Price:** \$995 retail; \$89 for upgrades.

**Snapshot:** Peer-to-peer functionality isn't the main draw of Microsoft's new operating system. Nevertheless, Windows 95 has peer-to-peer functionality that surprises that of Windows for Workgroups. Among the biggest advances is the system's more sophisticated security features.

**Microsoft Corp.**  
Redmond, Wash.  
(206) 932-8000

##### OS/2 Warp Connect

**Price:** \$995.

**Snapshot:** Offering peer-to-peer as a side feature, OS/2 Warp Connect's strength, officials say, lies in its interoperability with major peer-to-peer systems. There are also remote access features and TCP/IP for Internet access.

**IBM**  
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##### PowerLAN 3.1

**Price:** \$99 for one user; five-user pack costs \$399.

**Snapshot:** PowerLAN 3.1's strong suit is its scalability, according to Performance Technology, Inc. The network operating system supports up to 200 users when PowerLAN 3.1 is built up with a dedicated server component that costs \$299. PowerLAN 3.1's server technology is based on software development, up to years ago, originally to replace minicomputers with dedicated servers.

**Performance Technology, Inc.**  
San Antonio  
(800) FAST-LAN

##### Personal NetWare 1.0

**Price:** \$99 for one user; five-user pack costs \$395.

**Snapshot:** Personal NetWare is 1993, but in the past year, the company has been steering customers toward NetWare 4.1 as part of its emphasis on client/server computing. Novell considers peer-to-peer networking to be a limited paradigm. Even small customers that might once have chosen peer-to-peer networking will be better off with NetWare 4.1, officials say.

**Novell, Inc.**

Provo, Utah

(800) 453-1267

**InvisibleLAN 3.54**

**Price:** \$599 for single-user software license.

**Snapshot:** Another peer-to-peer pioneer, Invisible Software, Inc. was founded in

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## News

### Tuxedo

CONTINUED FROM COVER I

Boston. "It's a sophisticated bunch of complex functions, and that's clearly hard to sell," he said.

Sources said the enhancements in System 6, which ships immediately, include these key additions:

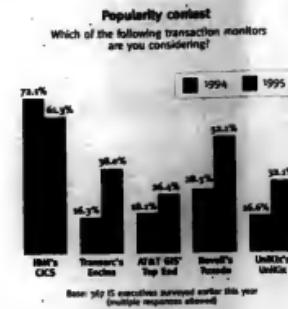
- A graphical user interface (GUI) based on the Open Software Foundation's Motif, for managing distributed Tuxedo applications.
- More granular workgroup-level control of user access to Tuxedo services.
- An event broker supporting the so-called "publish and subscribe" technology (see glossary at right).

#### One day off

A major shortcoming in Tuxedo has been its limited management capabilities, which could be invoked only through Unix command lines. The new centralized GUI will be "a big help," said Michael Prince, director of information services at Burlington Coat Factory Warehouse Corp. in Burlington, N.J. The company uses Tuxedo to funnel retail sales transactions into its back-office systems.

"One of the things that had held us back from using Tuxedo more widely than we have was the fact that the administration was primitive," Prince said. "You had to know the Unix commands, and it really wasn't friendly at all."

The event broker, which will let customers trigger multiple processing tasks



Source: The Standish Group International, Inc., Dennis, Mass.

based on predefined business events, also could be "an interesting building block" for future applications, Prince said. Burlington Coat Factory wants to use System 6 to expand Tuxedo into areas such as real-time check authorization and decision support, he said.

Tuxedo was the most popular Unix transaction monitor in 1994, with a 32% market share, according to The Standish Group International, Inc. in Dennis, Mass. However, it yielded just \$65 million in sales, and a Standish Group survey this year showed that customers expect to use transaction monitors in only about

one-third of their new business applications.

Tuxedo's new administration features, including the GUI and a comprehensive information base for storing network data, should "answer some of the criticisms leveled against Tuxedo that it's hard to work with," said Sally Cusack, a Standish Group analyst.

Meanwhile, the event broker propels Tuxedo into an emerging application area populated by middleware vendors such as Tektronix Software Systems, Inc. and Stratus Computer, Inc.'s less used Novell appears to have the most flexible publish-and-subscribe approach to date, and Tuxedo's transactional nature lets it back out of multiple-step processes if something goes wrong, Kramer said.

Novell declined to comment on the Tuxedo System 6 launch other than to confirm it is scheduled for next week.

**Microsoft** says Microsoft is running into the same software development problems identified 20 years ago. See page 37.

Microsoft's technicians are researching the problem and said they expect to have a resolution soon.

• **Hidden "attachies."** To multiple, remote NetWare file servers when the Network Neighborhood facility within Windows 95 is opened, Network Neighborhood lets users browse the network to view shared resources and applications. When users single-click a server from within Network Neighborhood, they unwittingly log on to other servers.

In this case, ignorance is not bliss: It can set the unsuspecting user and corporation a very large phone bill for a network that has an integrated Services

Digital Network wide-area network with dial-on-demand connections to remote offices. One user who had this unhappy experience logged on to the Windows 95 CompuServe forum and plaintively asked for "any hints that would let him shut down the hidden automatic server attachies."

Fortunately, there is an easy remedy: Network administrators can simply disable the "Entire Network" option within Network Neighborhood.

• **NetWare log-in scripts** that don't load terminate-and-stay-resident programs in Windows 95, making many everyday applications unavailable to users.

**Transaction processing monitor:** Traffic cop software that monitors the mechanics of providing and receiving reliable access to distributed data. A monitor for synchronous systems, network and application resources and handles tasks such as user authentication, security and record/recovery of failed servers.

**Management information base (MIB):** A database of information about network devices. A MIB can include data such as device statistics, port performance thresholds, error rates, event detection and problem alerts.

**Pub/sub and enabler:** An emerging form of distributed data processing driven by business events. Middleware is used to trigger a series of processing steps across multiple applications in response to pre-defined events such as electronic orders or stock price increases. Users are automatically notified when an event that affects them occurs.

### Windows 95

CONTINUED FROM COVER I

down 95 product manager. Workarounds exist for most glitches, they said.

It's what users don't know that can and will hurt them. Take the case of the anonymous user who freely boasted of his own ignorance in how to maintain or change network connections in Windows 95. He said, "I'm very open-minded. Maybe I just don't know how to use the Win 95 functions."

#### Quick help

In many cases, the fixes that would help users through the maze of migration woes are right at their fingertips in the Windows 95 Resource Kit. Or help is just a call away in the form of a free Application Notes that lists the cause/effect and fix for common stumbling blocks.

The most frequently encountered "gotchas" for NetWare users include the following:

- Failure of Windows 95 clients to connect to NetWare 4.x file servers in large networks with more than 256 simultaneous users. In this instance, users are literally locked off the network with no access to basic such as file or print services or electronic mail.

This issue cropped up just last week, and no workaround exists. Bennett said

### Solutions for common problems

**T**he following are workarounds for some of the more common user complaints.

- The NetWare log-in script won't run. Four quick steps will fix that:
  1. Make sure to end a performed server in the properties for the Microsoft Client for NetWare Networks. 2. If the frame type for the IPX/SPX-compatible network protocol is set to "auto," change it to the frame type the NetWare servers use. 3. If there is a "hardware = " statement in the config.sys file, remove

it or disable it by inserting a semicolon at the beginning of the line. 4. Make sure the IPX/SPX-compatible network protocol appears on the bindings tab in the properties for the PC's network adapter.

- The Windows 95 client is unable to see a NetWare server on a Token Ring network.

To fix this, enable source routing. You can do this by clicking the start button, pointing to settings and clicking on the control panel. Next, double-

click on the network icon. Then go to the configuration tab, click the IPX/SPX-compatible network protocol and click on properties. Finally, on the advanced tab, click on source routing in the property bar and click on "id entry cache (recommended)" in the value box.

- To sidestep the hidden attachies to remote NetWare file servers disable the "Entire Network" option in Network Neighborhood.

• To avoid creating SAP security breaches network administrators should turn off the network control panel so end users can't enable the facility — *Laura D'Addio*

## The Back Page

# Sequent taps 4-way Pentiums for parallel design

Charles Babcock



**S**equent Computer Systems expects to supply large servers using four-way Intel Pentium processor configurations as a building block. Intel is producing quad-Pentiums (formerly known as P6s), or four microprocessors on a synchronized mother/daughterboard unit, to encourage server design with its chips.

What's interesting is that Sequent is using these symmetrical multi-processing (SMP) units to get to a parallel processing design. Parallel processing is our most scalable computer architecture today, but it tends to require lots of system resources for each processor rather than assembling resources in a common pool.

Sequent is taking a low-cost CPU building block and arranging it in a design that can treat the cache memories of each block as shared across the system. It can't equal a massively parallel system with a thousand processors, but it promises to scale up to much greater heights than today's SMP sys-

tems, and SMP remains the best bang for the server buck.

IS shops continue to experience a growing need to consolidate PC servers and manage more desktop resources from a single server. Massively parallel technology is unlikely to fill this need any time soon, and SMP to date has been sharply limited in the sizes it could sustain.

Sequent's goal is to arrange multiprocessor nodes in parallel to treat the memory on each node as shared memory. That way, an application will run on a Sequent server as if it were addressing a common pool of memory rather than finding the application to be oversubscribed.

The Beaverton, Ore., firm is a key corporate ally of Intel and has had a lot to say about how the next-generation Pentium Pro was designed. It features 256K bytes of high-speed, Level 2 cache alongside the CPU in each chip module, a feature that

With Sequent's upcoming line, the age of the consolidated PC server will bloom.

sends server designs.

Sequent is likely to be among the first vendors to make scalable use of the four-way Pentium Pro units. These are not Intel motherboards with four processors, as is sometimes reported, but complete systems with power supplies, backplanes, I/O and daughterboard slots. Four-processor SMP machines can be built from them. However, the real challenge is configuring this building block into nodes that function with the scalability of parallel hardware but still hold to the operating system like a shared memory system.

As Sequent engineers well know, the more processors you load into an SMP server, the more traffic you get on the internal bus. Managing that traffic is one of the stumbling blocks of large-server design. Sequent will pump traffic between processors over a backplane, which is dubbed

the IQ Link.

Because Sequent places gallium arsenide "dalsa" pumps on the IQ Link, data will move between processors at the rate of a gigabyte per second. Adding processors adds more IQ Link interconnect cards and more bandwidth of data transfer capability, up to 2G byte/sec.

The high rate of speed along with special caching algorithms fool the operating system into viewing the separate processing nodes and their cache memory as a pooled resource. The nodes are arranged in parallel, but the application and operating system will address them as if they are running with a shared pool of memory, as in a

standard SMP design.

Sequent is unlikely to be the only computer vendor capable of tying together Intel's four-way units, but it has rich experience in dealing with the data transfer issues. With the birth of SMP nodes arranged in parallel, the age of the consolidated PC server will bloom and assume broader tasks within the enterprise.

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I commented in this space Oct. 9 that IS shops should move to Microsoft's NT Workstation and negotiate the price difference between it and Windows 95, drawing this reader response:

NT is clearly the appropriate enterprise desktop operating system. However, we have had zero success in getting the Microsoft representative to explain their marketing people into providing upgrade pricing from Windows 3.1 (or Windows for Workgroups) or even competitive upgrade pricing from OS/2.

Babcock is Computerworld's technical editor. His Internet address is charles\_babcock@cw.com.

## Inside Lines

### No paradise at Paradyne

Loyalty and longtime AT&T Paradyne employees were dejected about AT&T's decision last week to put Paradyne up for sale. But Paradyne acquired the unit in 1989 and has seen it develop a series of innovative technologies since then. But Paradyne employees aren't thrilled about the "new" AT&T, formed when the company separated into three units just weeks ago. One long-time AT&T Paradyne employee who was told that AT&T will block employees from transferring to other AT&T units said, "Friends and family? I think that's the other long-distance company."

### What's a few chips among friends?

The spirit of intramural cooperation mandated by Leo Gerstner is being put to the test as IBM tries to straighten out its muddled 64-bit PowerPC plans. Sources said options include continuing with the delayed PowerPC 620 chip; substituting a more advanced design; or handing the lead role to the AS/400 division, which already developed its own 64-bit PowerPC chip. The AS/400 chip is supposed to become a general-purpose device in its next incarnation, code-named Apache and due out in 1997. The debate is sparking quite a turf battle inside IBM, said an analyst close to the situation.

### Firewall fortress

Look for Oracle in Redwood Shores, Calif., to announce an alliance this week with seven vendors of firewall software. A firewall protects confidential data

when a site makes its relational database management system a public World Wide Web server.

### Back in the game at last?

Three years after Sun Microsystems' SuperSPARC workstation made its debut, the 80-MHz chip trails the pack of RISC chips from competitors IBM, Hewlett-Packard, Digital and others. Sun hopes to turn that around on Nov. 7 with the splashy announcement of a UNIX workstation line based on new 64-bit Ultra-SPARC chips.

### The 5th Wave by Rich Tennant



### NetWare manager ready

Novell will launch the next version of its ManageWise management software for NetWare networks this week at Enterprise Management Summit '95 in Dallas. Version 2.0 updates the NetWare management services with three types of integration [CW, July 10].

### users.plenty.mad

A company called The Marketry in Bellevue, Wash., has started selling lists of E-mail addresses, and Internet users are now too pleased. The firm gathers addresses from various newsgroups, packages them under a subject area indicated by the name of the newsgroup and sells them to other marketing companies, according to a post in the Usenet group, comp.risks. One sage says advised people in protest via E-mail to The Marketry at listpeople@marketry.com. But, as another poster pointed out, doing so will only add fodder to the first's lists.

If you missed the ISS radio broadcast, relive Orson Welles' spooky telling of the "War of the Worlds" over the Internet — just in time for Halloween. The story of a Martian invasion will play over a Web site sponsored by Los Angeles-based Web consulting company Internets Outfitters, starting Oct. 20. You'll have to download a free copy of Progressive Networks' RealAudio to hear the tale at <http://www.waroftheworlds.com>. Should space aliens invade your network before then, call Computerworld's 24-hour voice-mail tip line at (609) 820-8555 or our toll-free number at (800) 543-6474. News editor Maryfran Johnson can be reached by phone at (609) 820-3179 or via the Internet at [margfran\\_johnson@cw.com](mailto:margfran_johnson@cw.com).

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